CONTRACT DOCUMENTS FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046
AIP No. 3-06-0228-066-2026

DEPARTMENT OF
PUBLIC WORKS AND TRANSPORTATION

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COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

NOTICE AND INSTRUCTIONS TO BIDDERS

FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
NOTICE TO BIDDERS

Notice is given that sealed bids will be received at the office of the County Clerk-Recorder, 1055 Monterey Street, San Luis Obispo, California 93408 before 3:00 p.m. on Thursday, July 23, 2026 ("Bid Deadline"), for the following public works project:

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

Bids will be opened and declared by the County Clerk-Recorder at 3:15 p.m. on the bid opening date at a public meeting at 1055 Monterey Street, San Luis Obispo, California 93408.

Any bid received at the Office of the County Clerk-Recorder of the County of San Luis Obispo at or after 3:00 p.m. on the date specified above will not be accepted and will be returned to the bidder unopened. A bid received one second after 3:00 p.m. (i.e., after 3:00:00 p.m.) shall not be considered.

Bids are required for the entire work described in the Contract Documents.

The Bid package (also referred to herein as the "Contract Documents") are posted on the County's Purchasing website:

https://www.slocounty.ca.gov/departments/central-services/purchasing-services/services/bid-rfp-opportunities

Any changes, additions, or deletions to these Contract Documents will be in the form of written addenda issued by the County. Any addenda will be posted on the website. Prospective bidders must check the website for addenda or other relevant new information at up to 5:00 p.m. the day before the prescribed date/time for submittal of bids. The County is not responsible for the failure of any prospective bidder to receive such addenda. All addenda so issued shall become a part of this Bid.

All bidders are required to acknowledge and confirm receipt of every addendum in their bid proposal.

All bidder Requests for Information must be submitted no later than 3:00 p.m., 5 business days prior to the bid opening date. Requests submitted after said date may not be considered. All questions pertaining to the content of this invitation to Bid must be made in writing through the Purchasing website. Questions and responses will be posted on the Purchasing website and can be viewed by accessing the Invitation to Bid located at the Purchasing website. The identity of the entity submitting the question will not be posted. The County reserves the right to determine the appropriateness of comments / questions that will be posted on the website.

Bidders are notified that financing for this project is provided in part by Federal Aviation Administration (FAA) Airport Improvement Program (AIP) and Airport Infrastructure Grants (AIG). Contractor(s) will be required to comply with specific federal contract provisions as listed herein and contained in the bid documents.

Title VI Solicitation Notice

The County of San Luis Obispo, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC §§ 2000d to 2000d-4) and related regulations, hereby notifies all bidders that it will affirmatively ensure that all bidders will be afforded a full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Disadvantaged Business Enterprise (DBE)

The requirements of 49 CFR Part 26 including any amendments thereto apply to this contract. It is the policy of the County to practice nondiscrimination based on race, color, sex, or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

Federal Fair Labor Standards Act (Federal Minimum Wage)

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR part 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers.

The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

Trade Restriction Certification

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror –

1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);

2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the USTR; and

3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 USC Section 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR or
2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list or
3) who incorporates in the public works project any product of a foreign country on such USTR list.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration (FAA) may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

Required Federal Contract Provisions by Reference

The following provisions are incorporated herein by reference with the same force and effect as if given in full text (refer to Federal Contract Provisions section of the specifications for further details):

1. **BUY AMERICAN PREFERENCE**
   (Source: Title 49 USC § 50101; Executive Order 14005, *Ensuring the Future is Made in All of America by All of America's Workers;* Bipartisan Infrastructure Law (Pub. L. No. 117-58), Build America, Buy America (BABA)

2. **CIVIL RIGHTS – GENERAL**
   (Source: 49 USC § 47123)

3. **DAVIS-BACON REQUIREMENTS**
   (Source: 2 CFR Part 200, Appendix II(D); 29 CFR Part 5; 49 USC § 47112(b); 40 USC §§ 3141-3144, 3146, and 3147)

4. **DEBARMENT AND SUSPENSION**
   (Source: 2 CFR Part 180 (Subpart B); 2 CFR Part 200, Appendix II(H); 2 CFR Part 1200; DOT Order 4200.5; Executive Orders 12549 and 12689)

5. **LOBBYING AND INFLUENCING FEDERAL EMPLOYEES**
   (Source: 31 USC § 1352 – Byrd Anti-Lobbying Amendment; 2 CFR Part 200, Appendix II(I); 49 CFR Part 20, Appendix A)

6. **PROCUREMENT OF RECOVERED MATERIALS**
   (Source: 2 CFR § 200.323, 2 CFR Part 200, Appendix II(J), 40 CFR Part 247, 42 USC § 6901, et seq (Resource Conservation and Recovery Act (RCRA))

(See Federal Contract Provisions of the Bid Documents for further details.)

Successful Bidder will be required to insert applicable Federal Contract Provisions in all subcontracts and shall be responsible for compliance by subcontractor(s).

Prevailing Wages and Payroll Records

Contractor will be required to pay employees and keep records in accordance with the Davis Bacon Act (29 CFR Part 5) and/or Federal Fair Labor Standards Act (29 CFR part 201).

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR Part 201, et seq, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers. The successful bidder has full responsibility to monitor compliance to the referenced statute or regulation. The successful bidder must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

The bidder must have a Class B license at the time the contract is awarded.

Pursuant to Labor Code section 1771.1:

- A Contractor or Subcontractor shall not be qualified to bid on, be listed in the Bid Proposal, subject to the requirements of the Public Contract Code section 4104, or engage in the performance of this public works project, unless currently registered with the Department of Industrial Relations and qualified to perform work pursuant to Labor Code section 1725.5. It is not a violation of this section for an unregistered Contractor to submit a bid that is authorized by Business and Professions Code section 7029.1, Public Contract Code section 10164, or Public Contract Code section 20103.5, provided the Contractor is registered to perform public work pursuant to Labor Code section 1725.5 at the time the contract is awarded.
- This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

Bids must be submitted under sealed cover plainly marked as a bid and identified with the project number, the date and time for receipt of sealed bids, and the name of the bidder.

Bids must be accompanied by cash, a certified or cashier's check, or a bidder's bond in favor of the County in an amount not less than ten percent (10%) of the submitted total Bid.

Pursuant to Public Contract Code section 22300, the successful bidder may substitute certain securities for funds withheld by County to ensure performance under the Contract or, in the alternative, request the County to make payment of retention to an escrow agent.

The successful bidder will be required to furnish the County with payment and performance bonds, with each issued by a California admitted surety insurer equal to 100% of the Contract Price.

Bidders must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible (2 CFR 200.321).

Pursuant to section Labor Code section 1770 et seq., the Contractor and all Subcontractors shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations and comply with all applicable Labor Code provisions, which include, but are not limited to the employment of apprentices, the hours of labor, and the debarment of Contractors and Subcontractors. The Director of the California Department of Industrial Relations determines the general prevailing wage rates. Copies are available at the at the DIR website, http://www.dir.ca.gov/DLSR/PWD.

The Bidder's attention is directed to FAA General Contract Provisions, Proposal Requirements and Conditions for general details on the preparation of proposals for this Project. Each Bidder shall submit "evidence of competency" and "evidence of financial responsibility" at the time of bid opening.

Prohibition of Covered Unmanned Aircraft Systems (UAS)

The Bidder certifies that they are aware of and comply with relevant Federal statutes and regulations, including those from the Federal Aviation Administration (FAA), for operating unmanned aircraft systems (UAS) in accordance, and in compliance with all related requirements in the FAA Reauthorization Act of 2024 (Public Law 118-63), section 936 (49 U.S.C. § 44801 note). Bidder warrants that all UAS operations will be conducted in full compliance with all applicable Federal Aviation Administration (FAA) regulations, including but not limited to 14 CFR Part 107, and any other applicable local, state, or Federal laws and regulations. Sponsors and subgrant recipients cannot use AIP grant funds to enter into, extend, or renew a contract related to covered unmanned aircraft systems (UAS). This includes both procurement and operational contracts, as well as contracts with entities that operate such systems.

Executive Order N-6-22 – Russia Sanctions

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. Should the State or County determine Contractor is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for termination of this agreement. The County shall provide Contractor advance written notice of such termination, allowing Contractor at least 30 calendar days to provide a written response. Termination shall be at the sole discretion of the County.

By order of the Board of Supervisors of the County of San Luis Obispo in their action on the 23rd day of September 2025.

END OF NOTICE TO BIDDERS

INSTRUCTIONS TO BIDDERS

1. FEDERAL REQUIREMENTS

This Project is funded by the FAA and as such is subject to extensive Federal requirements and provisions in the areas of labor, wage rates, notices for Contracts, and bidding provisions. The Bidder's attention is directed to the "Required Federal Contract Provisions," and "FAA General Contract Provisions" for detailed information on FAA requirements.

2. DESCRIPTION OF WORK

The Project will consist of improvements to the existing Outbound Baggage Screening area . Specifically, the Project scope includes the following elements:

- Expansion of the outbound baggage room using a sprung structure and connector;
- Site drainage modifications in the area of the new structure;
- Structural elements consisting of a slab on grade and foundations for the sprung structure, footings for the pre-engineered canopy and modifications of existing building openings;
- Anchorage of tensile structure and make-up canopy;
- A new mechanical system to serve the structure;
- Extension of electrical, technology, fire alarm and fire sprinkler systems into the new structure;
- New baggage handling equipment (BHE) as well as a carousel at the baggage make-up area; and
- Project phasing, interim baggage handling equipment and protective cover.

3. CONTRACT DOCUMENTS

The Contract Documents may be obtained from the County at the location specified in the Notice to Bidders.

The Contract Documents include the Notice to Bidders, Instructions to Bidders, Bid Forms, Agreement, General Conditions, Special Provisions, if any, Project Plans, Improvement Standards, Standard Specifications, and Standard Plans.

The County Public Improvement Standards may be viewed at the following County Website:

https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Development-Services/Public-Improvements/Public-Improvement-Standards/County-Public-Improvement-Standards-2022.pdf

The Standard Specifications and Standard Plans may be viewed at the following Caltrans website:

https://dot.ca.gov/programs/design/ccs-standard-plans-and-standard-specifications

The County does not assume any liability or responsibility based on any defective or incomplete copying, excerpting, scanning, faxing, downloading, or printing of the Contract Documents.

For purposes of this Contract, the Caltrans Standard Specifications have been modified numerous times throughout these Contract Documents. For example, pursuant to Section 1-1.01A of the General Conditions, Division I (General Provisions) of the Caltrans Standard

Specifications is superseded by the General Conditions of these Contract Documents. Other modifications to the Caltrans Standard Specifications may also appear at other locations in the Contract Documents. Furthermore, in the event of any conflict between the Caltrans Standard Specifications and any other language in these Contract Documents, the other language in these Contract Documents shall take precedence over the Caltrans Standard Specifications.

4. JOB SITE AND CONTRACT DOCUMENT EXAMINATION

Bidders are responsible for examining the job site and the Contract Documents, including any Addenda issued prior to the Bid Deadline, and for informing themselves with respect to local labor availability, means of transportation, necessity for security, laws and codes, local permit requirements, wage scales, local tax structure, contractors licensing requirements, availability of required insurance, and other factors that could affect the work. Bidders are responsible for consulting the standards referenced in the Contract Documents.

Submission of a Bid is a bidder's acknowledgment that the bidder has examined the job site and bid documents and is satisfied with:

1. General and local conditions to be encountered
2. Character, quality, and scope of work to be performed
3. Quantities of materials to be furnished
4. Character, quality, and quantity of surface and subsurface materials or obstacles
5. Requirements of the Contract Documents

5. PRE-BID MEETING

A non-mandatory pre-bid meeting will be held at 975 Airport Drive, San Luis Obispo, CA 93401 at 9:00 AM , local time, Tuesday, July 14, 2026.

6. ADDENDA

The County reserves the right to revise the Contract Documents prior to the Bid opening date. Revisions, if any, will be made by written Addenda. All Addenda issued by the County shall be included in the Bid and made part of the Contract Documents. Pursuant to Public Contract Code section 4104.5, if the County issues an Addendum that includes material changes to the work less than 72 hours prior to the Bid Deadline, the County will extend the Bid Deadline. The County may determine, in its sole discretion, whether an Addendum warrants postponement of the Bid Deadline.

All Addenda issued will be posted on the following website:

https://www.slocounty.ca.gov/departments/central-services/purchasing-services/services/bid-rfp-opportunities

Prospective bidders must check the website for addenda or other relevant new information during the response period. The County is not responsible for the failure of any prospective bidder to receive such addenda. All addenda so issued shall become a part of this Bid.

All bidders are required to acknowledge and confirm receipt of each and every addendum in their Bid. Failure to acknowledge all Addenda may result in a Bid being deemed nonresponsive and not eligible for award of the Contract.

7. SUPPLEMENTAL PROJECT INFORMATION

The County makes Supplemental Project Information available for review at the following website:

https://www.slocounty.ca.gov/departments/central-services/purchasing-services/services/bid-rfp-opportunities

8. ENGINEER'S ESTIMATE

The engineer's estimate is provided by the County related to this work and has been provided strictly for informational purposes and cannot be relied upon by any bidder as representing an accurate estimate of the value of the work. The estimated cost of construction for this Project is:

- Base Bid – $6,610,614

The purpose of providing any such engineer's estimate is simply to provide each potential bidder with some preliminary information relating to whether the work may be within its bonding capacity and available resources. Under no circumstance may a bidder rely upon the engineer's estimate as representing a reasonable value of the work.

9. COMPLETION OF BID FORMS

Prepare bids using only copies of the Bid Forms, which are included in the Contract Documents issued by the County. The use of Bid Forms other than clear and correct photocopies of those provided by the County will not be permitted. Bids must be executed by an authorized signatory as described in these Instructions to Bidders. Bidders must fill in all blank spaces (including inserting "N/A" where applicable) and initial all interlineations, alterations, or erasures to the Bid Forms. Bidders must not delete, modify, or supplement the printed matter on the Bid Forms or make substitutions thereon. Use of black or blue ink, indelible pencil, or a typewriter is required. Deviations in the Bid Forms may result in a Bid being deemed nonresponsive and not eligible for award of the Contract.

10. GENERAL REQUIREMENTS

The Bidder's attention is directed to FAA General Contract Provisions, Section 20, Proposal Requirements and Conditions for general details on the preparation of proposals for this Project.

Each Bidder shall submit "evidence of competency" and "evidence of financial responsibility" at the time of bid opening.

11. LICENSING REQUIREMENTS

Pursuant to Business and Professions Code section 7028.15, bidders must possess licenses issued by the California Contractors State License Board for performance of this Contract. Subcontractors must possess the appropriate licenses for each specialty subcontracted.

The County has determined that bidders must have the class of license designated in the Notice to Bidders to be eligible for award of this Contract. The Contractor shall be properly licensed by the time the Contract is awarded, pursuant to the provisions of Public Contract Code section 20103.5. Failure of the bidder to obtain proper and adequate licensing for award of the Contract constitutes a failure to execute the Contract and shall result in the forfeiture of the security of the bidder.

Pursuant to Public Contract Code section 20676, sellers of "mined material" must be on an approved list of sellers published pursuant to Public Resources Code section 2717(b) in order to supply mined material for this Contract.

12. REGISTRATION REQUIREMENTS

Pursuant to Labor Code section 1771.1(a), a Contractor or Subcontractor shall not be qualified to bid on, be listed in a bid proposal subject to the requirements of Public Contract Code section 4104, or engage in the performance of this Contract unless currently registered with the California Department of Industrial Relations and qualified to perform public work pursuant to Labor Code section 1725.5. It is not a violation of Labor Code section 1725.5 for an unregistered Contractor to submit a Bid on this federally-funded Contract, provided the Contractor is registered to perform public work pursuant to Labor Code section 1725.5 at the time this Contract is awarded.

13. BID SECURITY

Each Bid shall be accompanied by Bid Security consisting of: (a) cash; (b) a certified check made payable to the County; (c) a cashier's check made payable to the County; or (d) a bidder's bond in favor of the County executed by the bidder as principal and surety as obligor, in an amount not less than 10% of the total Bid.

The surety insurer shall be admitted to transact surety business in the State of California, as defined in Code of Civil Procedure section 995.120. Personal sureties and unregistered surety companies are unacceptable. The cash, check, or bidder's bond shall be given as a guarantee that the bidder: (1) will execute the Contract if it is awarded to the bidder, and (2) shall provide the required payment and performance bonds and insurance certificates and endorsements as required by the Contract Documents. Failure to provide the required documents may result in forfeiture of the Bid Security and the County may award the Contract to another bidder or may call for new Bids.

14. BID ITEM LIST

Bidder shall submit a Bid based on the bid item quantities the County shows on the Bid Item List. The Bid Item List is included in the Bid Forms.

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, except as provided:

A. If the amount set forth as a unit price is ambiguous, unintelligible, or uncertain for any reason, or is omitted, or is the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.

B. (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage-wise the unit price or item total in the County's final estimate of cost.

15. DESIGNATION OF SUBCONTRACTORS (Public Contract Code 4100-4114)

On the *Designation of Subcontractors* form, bidders shall list each Subcontractor to whom the bidder proposes to directly subcontract portions of the work in an amount in excess of 1/2 of

one percent of the total Bid, or in the case of bids for the construction of streets and highways, including bridges, in excess of 1/2 of one percent or $10,000, whichever is greater. The *Designation of Subcontractors* form for listing Subcontractors is included in the Bid Forms.

For each Subcontractor listed, the *Designation of Subcontractors* form must show:

1. Business name and the location of its place of business.
2. California contractor license number.
3. Public works contractor registration number (DIR Registration Number)
4. Portion of work it will perform. Show the portion of the work by:
    4.1. Description of portion of subcontracted work
    4.2. Bid item numbers for the work involved in the portion of work listed
    4.3. Percentage of the total Bid for each bid item listed

16. CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS.

Bidders must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

Affirmative steps must include:

1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

17. BIDDER'S EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

Bidder shall submit the certification required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)). The certification is included in the Bid Forms section of the Contract Documents.

18. SUBCONTRACTOR'S EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

Bidder shall submit the certification for each subcontractor required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)). The certification is included in the Bid Forms section of the Contract Documents.

19. CERTIFICATION OF NON-SEGREGATED FACILITIES

Bidder shall submit the certification, under penalty of perjury, certifying that the bidder's facilities are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The certification is included in the Bid Forms section of the Contract Documents.

20. DEBARMENT AND SUSPENSION

In accordance with the provisions of the Labor Code, Contractors or Subcontractors may not perform work on a public works project with a Subcontractor who is ineligible to perform work on a public project pursuant to Labor Code section 1777.1 or section 1777.7. Any contract on a public works project entered into between a Contractor and a debarred Subcontractor is void as a matter of law. A debarred Subcontractor may not receive any public money for performing work as a Subcontractor on a public works contract. Any public money that is paid to a debarred Subcontractor by the Contractor shall be returned to the County. The Contractor shall be responsible for the payment of wages to workers of a debarred Subcontractor used on the work

A list of Contractors barred by the Division of Labor Standards Enforcements is available on the following Department of Industrial Relations website:

http://www.dir.ca.gov/dlse/debar.html

In accordance with 2 CFR 180 and 2 CFR 3000, Contractors or Subcontractors shall not perform work on this project if they are debarred, suspended, or otherwise excluded from or ineligible for participation in federal assistance programs. The *Excluded Parties List System (EPLS) is* maintained by the General Services Administration (GSA) and available at the following website:

https://sam.gov/content/home

21. PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

The bidder shall complete, under penalty of perjury, the *Public Contract Code Section 10162 Questionnaire* form. The questionnaire is included in the Bid Forms section of the Contract Documents.

22. PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

The bidder shall complete, under penalty of perjury, the *Public Contract Code Section 10232 Statement* form. The form is included in the Bid Forms section of the Contract Documents.

23. PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

The bidder shall complete, under penalty of perjury, the *Public Contract Code Section 10285.1 Statement* form. The form is included in the Bid Forms section of the Contract Documents.

24. DECLARATION OF NONCOLLUSION

The *Declaration of Noncollusion* form shall be signed, under penalty of perjury, certifying that the Bid is not the result of and has not been influenced by collusion. Any Bid made without such declaration, or believed to be made in violation thereof, may be rejected.

25. IRAN CONTRACTING ACT CERTIFICATION

Each bidder shall submit the certification required by the Iran Contracting Act of 2010, Public Contract Code section 2200 et seq., with its Bid for any Bid $1 million or more. The certification is included in the Bid Forms section of the Contract Documents.

26. LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

Reference 31 USC § 1352 – Byrd Anti-Lobbying Amendment, 2 CFR part 200, Appendix II(J), 49 CFR part 20, Appendix A).

For any bid of $100,000 or more, bidder must certify that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or another award covered by 31 USC 1352. Each tier must also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award.

27. SIGNING OF BIDS

All Bids submitted shall be executed by the bidder or its authorized representative. Bidders may be asked to provide evidence in the form of an authenticated resolution of its Board of Directors or a Power of Attorney evidencing the capacity of the person signing the Bid to bind the bidder to each Bid and to any Contract.

If the bidder is a corporation, the legal name of the corporation shall be set forth on the Bid Proposal Form with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If the bidder is a partnership, the true name of the firm shall be set forth on the Bid Proposal Form with the signature of the partner or partners authorized to sign contracts on behalf of the partnership. If the bidder is an individual, his or her signature shall be placed on the Bid Proposal. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be submitted with the Bid; otherwise, the Bid will be disregarded as irregular and unauthorized.

28. SUBMISSION OF SEALED BIDS

Once the Bid Forms have been completed and signed as set forth herein, place them, along with the Bid Security and other required materials, in an envelope, sealed, addressed, and delivered or mailed, postage prepaid, to the County as indicated in the Notice to Bidders. No oral or telephonic bids will be considered. No forms transmitted via the internet, e-mail, facsimile, or any other electronic means will be considered. Bids must be plainly marked as a Bid and identified with the Project number, the date and time of receipt of sealed Bids, and the name of the bidder.

29. DELIVERY AND OPENING OF BIDS

Bids will be received by the County at the address shown in the Notice to Bidders prior to the date and time shown therein. The County will leave unopened any Bid received after the specified date and time, and any such unopened Bid will be returned to the bidder. It is the bidder's sole responsibility to ensure that its Bid is received as specified. Bids may be submitted earlier than the date and time indicated.

Bids will be opened as stated in the Notice to Bidders, and the amount of each Bid will be read aloud and recorded. All bidders may, if they desire, attend the opening of Bids. The County may, in its sole discretion, elect to postpone the opening of the submitted Bids. County reserves the right to reject any or all Bids and to waive any informality or irregularity in any Bid.

30. WITHDRAWAL OF BID

Any bidder may withdraw its Bid by written request any time prior to the time set forth in the Notice to Bidders for the opening of Bids by notice to the County Clerk-Recorder at 1055

Monterey Street, San Luis Obispo, CA 93408. Such notice shall be in writing signed by the bidder and shall be received, and date-stamped and time-stamped by the County Clerk-Recorder. Withdrawn Bids may be resubmitted on or before the time set forth in the Notice to Bidders for receipt of Bids provided that they are in full conformance with the Contract Documents. Once submitted, all Bids are irrevocable, except as otherwise provided by law. Each bidder agrees by submitting a Bid that its Bid shall remain open, is irrevocable, and may not be modified, withdrawn, or cancelled for a period of at least 90 days after Bid opening. Any request for County's consent to permit a bidder to withdraw a Bid after the Bid Deadline must be made in accordance with Public Contract Code section 5100 et seq., including, but not limited to, submission of written notice to the County within 5 business days after Bid opening specifying in detail how the mistake occurred.

31. RESERVATION OF RIGHTS

The County reserves the right to reject any or all bids, and to waive discrepancies, irregularities, informalities, or any other error in the bid or bidding, if to do so seems to best serve the public interest. The right of the County to waive errors applies even if the Contract Documents state that a discrepancy, irregularity, informality, or other error make a bid nonresponsive, so long as the error does not constitute a material error.

The County reserves the right, in its sole discretion, to: judge the bidder's representations as stated in the Bid forms and any post-Bid information to determine whether or not bidder is qualified to perform the work; be the sole judge regarding the suitability of the products, services, or supplies offered; to not purchase all items or the full quantity of each item listed in the Bid Item List; reject any or all Bids; waive any deficiencies, irregularities, or informalities in any Bids or in the bidding process; modify, cancel, or withdraw the Notice to Bidders; issue a new Notice to Bidders; suspend or abandon the Project; seek the assistance of outside technical experts in Bid evaluation; require a bidder to provide a guarantee (or guarantees) of the Contract by a third party; and not issue a Notice to Proceed after execution of the Contract. In submitting a Bid in response to the Notice to Bidders, the bidder is specifically acknowledging the County holds these rights. The Notice to Bidders does not commit the County to enter into a Contract, to reject, in its sole discretion, all Bids, nor does it obligate the County pay for any costs incurred in preparation and submission of a Bid or in anticipation of a Contract. By submitting a Bid, the bidder disclaims any right to be paid for such costs.

32. BASIS OF AWARD; BALANCED BIDS

The County will award the Contract to the responsible bidder that submits the lowest responsive Bid, which shall be determined as set forth in the Notice to Bidders and as provided in these Instructions to Bidders and identified as "TOTAL BASE BID" on the Bid Form. The Project will be bid as a single Project..

In accordance with 23 CFR 635.102, bids in which the prices are mathematically or materially unbalanced may be rejected. Following are the definitions of mathematically and materially unbalanced bids:

- A bid is mathematically unbalanced if the bid is structured on the basis of nominal prices for some work and inflated prices for other work; that is, each element of the bid must carry its proportionate share of the total cost of the work plus profits.

- A bid is materially unbalanced if there is reasonable doubt that award to the bidder submitting the mathematically unbalanced bid will result in the lowest ultimate cost to the County.

33. DISQUALIFICATION OF BIDDERS; INTEREST IN MORE THAN ONE BID

No bidder shall be allowed to make, submit, or be interested in more than one Bid. However, a person, firm, corporation or other entity that has submitted a proposal to a bidder, or that has quoted prices of materials to a bidder, is not thereby disqualified from submitting a proposal or quoting prices to other bidders submitting a Bid to the County, or submitting a Bid to the County as a prime bidder.

A firm that the County has hired to provide architectural or engineering services to the County for this Contract before Bid submittal for this Contract is prohibited from all of the following:

1. Submitting a Bid;
2. Subcontracting for a part of the work; and
3. Supplying materials.

34. INSURANCE REQUIREMENTS

The successful bidder shall procure and maintain insurance in the forms, in the amounts and for the durations specified in the General Conditions.

35. RESPONSIVE BID

A responsive Bid is a Bid that conforms, in all material respects, to these Instructions to Bidders. Non-responsive Bids will be rejected.

36. RESPONSIBLE BIDDER

A responsible bidder has the ability to perform successfully under the terms and conditions of the Contract Documents, as defined in 2 CFR 200.318(h). This includes such matters as Contractor integrity, compliance with public policy, record of past performance, and financial and technical resources. Non-responsible Bids will be rejected.

37. EVIDENCE OF RESPONSIBILITY AND ADDITIONAL INFORMATION

In addition to other provisions of the Bidding Requirements, upon the request of the County, a bidder whose Bid is under consideration for the award of the Contract shall promptly submit satisfactory evidence to County showing the bidder's financial resources, experience in the field, and organization and other factors evidencing bidder's ability to successfully execute and complete the Contract.

38. AWARD PROCESS

Once all Bids are opened and reviewed to determine the lowest responsive and responsible bidder, the County may award the Contract or reject all Bids. Once the County notifies the selected bidder of the award, the bidder will have 5 business days from the date of the award and tender of Contract to deliver to the County the executed Contract, all of the required bonds, evidence of insurance, and other materials set forth in the Contract Documents. Once the County receives all of the properly executed documents and certifications, the County will deliver the fully executed Contract to the Contractor and issue a Notice to Proceed. If the County's issuance of a Notice to Proceed is delayed due to Contractor's failure to return fully-executed Contract,

insurance, bond, and other required documents within 5 business days after the award and tender of the Contract, then Contractor agrees to the deduction of 1 working day from the number of days in the Contract Time for every day of delay in County's receipt of said documents. This right is in addition to and does not affect the County's right to demand forfeiture of the Bid Security if Contractor persistently delays in providing the required documentation.

39. RETENTION AND SUBSTITUTION OF SECURITY

The County will make monthly progress payments based upon work performed in accordance with the Contract Documents. Unless otherwise specified in the Notice to Bidders, the County will retain five percent (5%) of each progress payment as provided by the Contract Documents. At the request and expense of the Contractor, the Contractor may substitute securities for the amount so retained, or in the alternative, request the County make payment to an escrow agent in accordance with Public Contract Code section 22300. Contractor shall have 30 days following award of the Contract to submit a written request to the County to permit substitution of securities or payment of retention to an escrow agent; failure to do so shall be deemed a waiver of the right.

40. PERFORMANCE BOND AND PAYMENT (LABOR AND MATERIALS) BOND REQUIREMENTS

The successful bidder shall deliver to the County two (2) fully executed, identical counterparts of the performance bond and payment (labor and materials) bond in the form supplied by the County and included in the Contract Documents. The penal amount of each bond shall be for one hundred percent (100%) of the total Contract Price. The surety insurer shall be admitted to transact surety business in the State of California, in accordance with Code of Civil Procedure section 995.120. Personal sureties and unregistered surety companies are unacceptable. Failure to furnish a bond within this time may, in the sole discretion of County, result in the forfeiture of the Bid Security.

41. SALES AND OTHER APPLICABLE TAXES, PERMITS, LICENSES AND FEES

Contractor and its Subcontractors performing work under this Contract will be required to pay California sales tax and other applicable taxes, and to pay for permits, licenses, and fees required by the agencies with authority in the jurisdiction in which the work will be located, unless otherwise expressly provided by the Contract Documents. Bidders shall include all applicable taxes and fees that are in effect or reasonably anticipated at the Bid Deadline in all Bid prices.

42. BID RIGGING

The U.S. Department of Transportation (DOT) provides a toll-free hotline to report bid rigging activities. Use the hotline to report bid rigging, bidder collusion, and other fraudulent activities. The hotline number is (800) 424-9071. The service is available 24 hours a day, 7 days a week and is confidential and anonymous. The hotline is part of the DOT's effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General.

43. BID PROTEST PROCEDURE

Bid protests and other challenges to the award of this Contract must comply with Rules Governing Bid Protests and Other Challenges to Awards of Construction Contracts ("Rules").

The Rules are available on the following County website:

https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Design.aspx

In addition, any Bid protest must be submitted in writing to the Department of Public Works, Room 206, County Government Center, 976 Osos Street, San Luis Obispo, CA 93408; Attention: Design Engineer.

44. ADVANCED CLEAN FLEETS

Vehicles with a GVWR greater than 8,500 lbs. and light-duty package delivery vehicles operated in California may be subject to the California Air Resources Board Advanced Clean Fleets regulations. Such vehicles may therefore be subject to requirements to reduce emissions of air pollutants. For more information, please visit the CARB Advanced Clean Fleets webpage at https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets. All fleets hired by the County shall be listed on the CARB Advanced Clean Fleets webpage as a compliant fleet or the fleet owner must provide a signed statement that its fleet is not subject to the High Priority and Federal Fleets regulations in title 13, CCR, sections 2015 through 2015.6 and the State and Local Government Fleets regulations in title 13, CCR, sections 2013 through 2013.4.

45. IN-USE OFF-ROAD DIESEL-FUELED FLEETS

The California Air Resources Board ("CARB") implemented amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulations ("Regulation") which went into effect on January 1, 2024, and apply broadly to all self-propelled off road diesel vehicles 25 horsepower or greater and other forms of equipment used in California. A copy of the Regulation is available at https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation. Bidders are required to comply with all CARB and Regulation requirements, including, without limitation, all applicable sections of the Regulation, as codified in Title 13 of the California Code of Regulations section 2449 et seq. throughout the duration of the Project. The successful bidder shall submit to the County current CARB Certificates for any applicable fleet intended to be used by the bidder and for any applicable fleet intended to be used by all listed subcontractors within five (5) days of the date of award. Failure to provide CARB Certificates may result in the forfeiture of the successful bidder's bond, and the County reserves the right to then award to the next lowest responsive and responsible bidder.

END OF INSTRUCTIONS TO BIDDERS

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

BID FORMS

FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

BID PROPOSAL FORM

TO THE COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

NAME OF BIDDER _____

BUSINESS P.O. BOX _____

CITY, STATE, ZIP _____

BUSINESS STREET ADDRESS _____
(include even if P.O. Box used)

CITY, STATE, ZIP _____

PHONE NO: AREA CODE (_____) _____

FAX NO: AREA CODE (_____) _____

CONTRACTOR LICENSE NO. _____ **CLASSIFICATION** _____

PUBLIC WORKS CONTRACTOR REGISTRATION NO: _____

UEI NUMBER: _____

EMPLOYER'S TAX IDENTIFICATION NUMBER _____

BUSINESS TYPE (Check one): ☐ **Corporation** ☐ **Partnership** ☐ **Sole Proprietorship**
☐ **Limited Liability Company**

CONTACT PERSON NAME _____

CONTACT PERSON PHONE NO. _____

CONTACT PERSON E-MAIL _____

EMPLOYER'S TAX IDENTIFICATION NUMBER _____

Bidder agrees that the Bid and all prices shall remain open and shall not be withdrawn for a period of not less than **120 days** from the Bid Deadline, or until rejected by the County, whichever period is shorter.

1. ADDENDA

The undersigned acknowledges and confirms the receipt of the following Addenda:

Addenda Number	Date

and agrees that said addenda are covered in the bid proposal and shall form a part of the Contract Documents.

2. CERTIFICATION OF INSPECTION OF THE SITE AND CONTRACT DOCUMENTS

By signing below, Bidder certifies that it: has received, carefully examined, and is fully familiar with all of the provisions of the Contract Documents, including all Addenda and attachments, and that said Contract Documents contain sufficient detail regarding the work to be performed; has notified the County of any errors or omissions in the Contract Documents and unusual site conditions; has carefully checked all words, prices, and statements in this Bid Proposal Form; and has visited the job site and conducted such other field investigations which are prudent and reasonable in preparing the Bid. Bidder agrees that the County will not be responsible for any errors or omissions on the part of the undersigned in making the Bid.

3. BIDDER'S REPRESENTATIONS REGARDING INSURANCE AND BONDS

This Bid is made with the full knowledge of the kind, quantity, and quality of the materials and work required and, if it is accepted by the County, the bidder will enter into a Contract and furnish the bonds, insurance and other documents as required by the Contract Documents within 5 business days after award and tender of the Contract. **By its signature below, the bidder agrees to provide the proper evidence of insurance and bonds within 5 business days after County's tender of the Contract. Failure to do so may result in forfeiture of Bid Security and rescission of the award by the County.**

4. CONTRACTORS LICENSE CERTIFICATION

The undersigned certifies that:

Contractors License No. _____ issued by the California Contractors State License Board ("CSLB") to the undersigned on _____, _____, is current, valid, has not been revoked, suspended, or cancelled, and is appropriate to the work to be undertaken.

Contractors License Classification(s): _____

Expiration Date: _____

Name of Qualifying Individual: _____

5. TIME FOR COMPLETION

The bidder agrees that if awarded the Contract, it shall complete the work within the number of working days specified in the Contract Documents.

6. ATTACHMENTS TO THIS BID PROPOSAL FORM

Enclosed herewith (except as otherwise provided for optional forms) and by this reference incorporated herein and made a part of this Bid Proposal Form are the following items:

1. Bid Item List	☐
2. Designation of Subcontractors	☐
3. Fleet Compliance Certification	☐
4. Bidder's Information List	☐
5. Bidder's Equal Employment Opportunity Certification	☐
6. Subcontractor's Equal Employment Opportunity Certification	☐
7. Certification of Non-Segregated Facilities	☐
8. Declaration of Noncollusion	☐
9. Debarment and Suspension Certifications	☐
10. Public Contract Code Section 10162 Questionnaire	☐
11. Public Contract Code Section 10232 Statement	☐
12. Public Contract Code Section 10285.1 Statement	☐
13. Iran Contracting Act Certification	☐
14. Non-Lobbying Certification for Federal-Aid Contracts	☐
15. Disclosure of Lobbying Activities	☐
16. Certification regarding Foreign Trade Restrictions	☐
17. Certification of Compliance with FAA Buy American Preference - Construction Projects	☐
18. State of California Drug-Free Workplace Certification	☐
19. Certification of Offeror/Bidder Regarding Tax Delinquency and Felony Convictions	☐
20. Certification Regarding Domestic Preferences for Procurements	☐
21. Bidder's Statement on Previous Contract Subject to EEO clause	☐
22. Certification of Bidder Regarding Affirmative Action Program	☐
23. Bidder's Checklist	☐
24. Bidder's Bond or other Bid Security	☐

Bids are required for the entire work described herein. The amount for Bid comparison purposes will be the total of all items.

The bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose. In the case of unit basis items, the amount set forth under the "Total" column is the extension of the unit price bid on the basis of the approximate quantity for the item.

Bidder understands that the award of this Contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed herein.

Accompanying this Bid Proposal is a bidder's bond, cash, cashier's check, or a certified check, payable to the County of San Luis Obispo, for the sum of at least ten percent (10%) of the total of the bid. The proceeds thereof shall become the property of the County of San Luis Obispo if the Bid is withdrawn after the time fixed in the Notice to Bidders for the opening of Bids, or if, in case this Bid is accepted by the County and such bidder has received written notice that the Contract has been awarded to him/her, the undersigned shall fail within 5 business days to execute the Contract with the County and furnish all documents required in section 3-1.18 of the General Conditions. Otherwise, said Bid Security, except a bidder's bond, will be returned to the undersigned.

7. BIDDER'S ORGANIZATION AND SIGNATURE AUTHORIZATION

The undersigned certifies that he/she/they is/are authorized to sign this Bid and any subsequent Contract on behalf of the bidding firm or company and that the nature of this bidding firm is an individual, partnership, corporation, or limited liability company with the principals or authorized officers of the firm listed as follows:

Legal Name of Firm or Company: _____

Nature of Firm:
(Corporation, Partnership, Individual, etc.) _____

Principal Officers/Partners/Members: _____

_____

_____

_____

Name of President of Corporation: _____

Name of Secretary of Corporation: _____

Corporation is organized under laws of State of _____, and is authorized to transact business in the State of California.

_____
Signature

_____
Name (print/type)

_____
Title (print/type)

_____
Date

BID ITEM LIST
AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

BASE BID

ITEM NO.	CODE NO.	DESCRIPTION OF ITEM	APPROX. QUANTITY	UNIT OF MEASURE	UNIT PRICE (IN FIGURES) DOLLARS. CENTS	TOTAL AMOUNT DOLLARS. CENTS
1	C-100	Contractor Quality Control Program (CQCP)	1	LS		
2	C-102A-2.1	Prepare Stormwater Pollution Prevention Plan	1	LS		
3	C-102A-2.2	Implement Stormwater Pollution Prevention Plan	1	LS		
4	C-105	Mobilization	1	LS		
5	SP-100-3.1	Airfield Safety and Traffic Control	1	LS		
6	SP-100-3.2	Construction Staking and Survey Layout	1	LS		
7	SP-100-3.3	Airport Access and Haul Route Repair	1	LS		
8	SP-100-3.4	Chain Link Fence, Temporary	1	LS		
9	SP-100-3.5	Guard Post	2	EA		
10	SP-100-3.6	Asphalt Surface Course	60	TON		
11	SP-100-3.7	Crushed Aggregate Base Course	7	CY		
12	SP-100-3.8	Concrete Landing 4" Depth	30	SY		
13	SP-100-3.9	Concrete Landing, 6" Depth	4	SY		
14	SP-100-3.10	Concrete Landing with Step	4	SY		
15	SP-100-3.11	6" Fire Main Lateral	1	LS		
16	SP-100-3.12	Thrust Block	1	EA		
17	SP-100-3.13	6" x 6" Tapping Tee and Connection	1	EA		
18	SP-100-3.14	6" Gate Valve	2	EA		
19	SP-100-3.15	(N) Valve Can and Appurtenances on (E) Valve	1	EA		

Name of Bidder_____

20	SP-100-3.16	Remove Cap and Install Salvaged Fire Hydrant and Bury	1	EA		
21	P-101-5.1	Asphalt Concrete Pavement Removal	590	SY		
22	P-101-5.2	Concrete Pavement Removal	90	SY		
23	P-101-5.3	Concrete Sidewalk Pavement Removal	6	SY		
24	P-101-5.4	Demolish Existing Valve Box and Protect Valve in Place	1	EA		
25	P-101-5.5	Remove, Salvage, and Cap Existing Fire Hydrant	1	EA		
26	P-101-5.6	Remove Existing Bollards	2	EA		
27	P-152-4.1	Unclassified Excavation	40	SY		
28	P-152-4.2	Subgrade Preparation	40	SY		
29	D-701-5.1	Install 12" PVC Storm Drain Pipe	23	LF		
30	D-751-5.1	Construct and Install 18" x 18" Precast Catch Basin	1	EA		
31	D-751-5.2	Connect (N) Storm Drain Pipe to (E) Catch Basin	1	EA		
32	D-751-5.3	Adjust (E) Catch Basin Frame and Grate to Grade	1	EA		
33	L-110-5.1	Demolish Existing Cable and Conduit	80	LF		
34	N/A	Baggage Handling System Building and Equipment	1	EA		
					TOTAL BASE BID	

Name of Bidder_____

Signature of Bidder_____

Printed Name and Title_____

Date_____

DESIGNATION OF SUBCONTRACTORS – BASE BID

In accordance with the provisions of Public Contract Code section 4100 et seq., the undersigned Bidder sets forth the following:

a. The name, location of the place of business, and California contractors license number of each Subcontractor who will perform work or labor, or render service to the undersigned Prime Contractor in or about the construction of the work or improvement, or a Subcontractor licensed by the State of California who, under subcontract to the Prime Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the undersigned Prime Contractor's Total Bid or in the case of bids for the construction of streets and highways, including bridges, in excess of one-half of one percent or ten thousand dollars ($10,000), whichever is greater.*

b. The portion of the work which will be done by each such Subcontractor. Only one Subcontractor shall be listed for each such portion. If the Subcontractor is not performing all of the work under the bid item number(s) listed for that Subcontractor, the bidder shall set forth the portion of the work relating to said bid item number(s) that will be done by the Subcontractor.

Bid Item No.	Description of Trade/Portion of Work	Subcontractor Name	License No.	DIR Reg No.**	Business Address	Percent of Total Bid

By: _____

(Bidder's Company Name)

NOTES: *When there is a failure to list a Subcontractor as required, or when the Bidder lists two Subcontractor for the same portion of the work, the law provides that the Bidder agrees that bidder is fully qualified to perform that portion itself, and that the Bidder shall perform that portion itself. In such case, Bidder must be authorized to perform said work. Any Bid not complying with the provisions hereof may be rejected.

** Pursuant to Labor Code section 1771.1, no contractor or Subcontractor may be listed on the bid proposal for this public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

FLEET COMPLIANCE CERTIFICATION

Bidder hereby acknowledges that they have reviewed the California Air Resources Board's policies, rules and regulations and are familiar with the requirements of Title 13, California Code of Regulations, Division 3, Chapter 9, effective on January 1, 2024 (the "Regulation"). Bidder hereby certifies, subject to penalty for perjury, that:

I am aware of the emissions reduction regulations mandated by the California Air Resources Board. I will comply with such regulations and require my subcontractors to comply with such regulations prior to the commencement of the work, maintain compliance throughout the duration of the work, and provide the County with a Certificate of Reported Compliance for each entity utilized during the work.

Name of Bidder: _____

Signature: _____

Name: _____

Title: _____

Date: _____

BIDDERS INFORMATION LIST

All bidders/proposers are required to provide the following information for all DBE and non-DBE contractors, who provided a proposal, bid, quote, or were contacted by the proposed prime contractor. This information is required from the proposed prime contractor and shall be submitted with their bid proposal. The Department of Public Works will use this information to maintain and update a "Bidder's List" to assist in the overall annual Disadvantaged Business Enterprise (DBE) availability goal setting process required for Federal-aid projects. This information is also being made available to other local agencies for the same purpose. *To the extent permitted by law, all information submitted will be held in strict confidence and will not be shared without your consent except as noted above.*

Contractor: ☐ Prime Contractor ☐ Subcontractor ☐ Supplier ☐ Other: _____

Firm Name: _____ Phone: _____

Business Address: _____ Fax: _____

_____

License No.

and Classification _____ Years in Business: _____

Contact Person: _____

Is the firm currently certified as a DBE by Caltrans? ☐ No ☐ Yes Cert. Number: _____

Gross Annual Receipts for last year:
☐ less than $1 million ☐ less than $5 million ☐ less than $10 million
☐ less than $15 million ☐ more than $15 million

Type of work/ services/ materials provided for this job:
☐ Contractor ☐ Supplier ☐ Manufacturer ☐ Trucking ☐ Broker
☐ Other (describe): _____

Contractor Specialty for this job:
☐ Roadway Construction (including signing, paving, and concrete) (237310)
☐ Roadway Painting/Striping (237310)
☐ Highway Lighting & Signal Installation (238210)
☐ Bridge Construction (237310)
☐ Tunnel Construction (237990)
☐ Water, Sewer, & Pipeline Construction (237110)
☐ Power & Communication Transmission Line (including conduit construction) (237130)
☐ Landscaping (561730)
☐ Irrigation (237110)
☐ Other Heavy Construction (including parks, reclamation, reservoir, water & sewer treatment facilities) (237990)
☐ Masonry (including retaining walls and foundations) (238140)
☐ Concrete Retaining Walls (238110)
☐ Building Construction (236210/236220)
☐ Other (describe): _____

- Copy sheet as needed
- None of the information requested on this form is material to the County's determination of which Bidder's Bid is the lowest responsive bid.

BIDDER'S EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The Bidder _____ hereby certifies that he/she has ___ , has not _____, participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he/she has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filling requirements.

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)) and must be submitted by bidders and proposed Subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed Contractors and Subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

SUBCONTRACTOR'S EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The proposed Subcontractor _____ hereby certifies that he/she has ___ , has not ____, participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he/she has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filling requirements.

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)) and must be submitted by bidders and proposed Subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime Contractors and Subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

CERTIFICATION OF NON-SEGREGATED FACILITIES

FEDERALLY ASSISTED PROJECTS

The federally assisted construction contractor certifies that he/she does not maintain or provide for his/her employees any segregated facilities at any of his/her establishments, and that he/she does not permit his/her employees to perform their services at any location, under his/her control, where segregated facilities are maintained. The federally assisted construction contractor certifies further that he/she will not maintain or provide for his/her employees any segregated facilities at any of his/her establishments, and that he/she will not permit his/her employees to perform their services at any location, under his/her control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, written or oral policies or employee custom, or otherwise. The federally assisted construction contractor agrees that (except where he/she has obtained identical certifications from proposed subcontractors for specific time periods) he/she will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he/she will retain such certifications in his/her files.

Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

DECLARATION OF NONCOLLUSION

In accordance with Title 23 United States Code Section 112 and Public Contract Code Section 7106, the bidder declares as follows:

I am the _____ [title] of _____ [name of Bidder], the party making the foregoing Bid. The Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The Bid is genuine and not collusive or sham. The Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham Bid. The Bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham Bid, or to refrain from bidding. The Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the Bid price of the Bidder or any other bidder, or to fix any overhead, profit, or cost element of the Bid price, or of that of any other bidder. All statements contained in the Bid are true. The Bidder has not, directly or indirectly, submitted his or her Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham Bid, and has not paid, and will not pay, any person or entity for such purpose. Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration is executed on:

_____ [date], at _____ [city], _____ [state].

Signed: _____

Print Name: _____

If the Bidder fails to complete and properly sign this declaration, the Bid will be considered non-responsive and will be rejected.

DEBARMENT AND SUSPENSION REQUIREMENTS
FOR ALL CONTRACTS OVER $25,000
49 CFR PART 29

By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that at the time the bidder or offeror submits its proposal that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

The successful bidder, by administering each lower tier subcontract that exceeds $25,000 as a "covered transaction", must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: http://www.sam.gov.
2. Collecting a certification statement similar to the Certificate Regarding Debarment and Suspension (Bidder or Offeror), above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the FAA later determines that a lower tier participant failed to tell a higher tier that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedy, including suspension and debarment.

Signature	Name of Bidder
Date	Name and Title of Signing Official

Business Address

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

The Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the Bidder, any officer of the Bidder, or any employee of the Bidder who has a proprietary interest in the Bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes _____ No _____

If the answer is yes, explain the circumstances in the following space.

_____

_____

_____

_____

_____

_____

_____

_____

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

The Bidder hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Bidder's failure to comply with an order of a federal court which orders the Bidder to comply with an order of the National Labor Relations Board.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct:

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

The Bidder hereby declares under penalty of perjury under the laws of the State of California that the Bidder has ____, has not ____ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "Bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The Bidder must place a check mark after "has" or "has not" in one of the blank spaces provided.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct:

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code section 2200 *et seq.*)

As required by California Public Contract Code section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status regarding the Iran Contracting Act of 2010 (Public Contract Code section 2200 et seq.) is true and correct:

- The Contractor is not:

  (i) identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code section 2203; or

  (ii) a financial institution that extends, for 45 days or more, credit in the amount of $20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran.
- The County has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, the County will be unable to obtain the goods and/or services to be provided pursuant to the Contract.
- The amount of the Contract payable to the Contractor for the work does not exceed $1,000,000.

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

Note: In accordance with Public Contract Code section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of $250,000 or twice the Contract Price, termination of the Contract and/or ineligibility to bid on contracts for three years.

NON-LOBBYING CERTIFICATION FOR FEDERAL-AID CONTRACTS

The Bidder certifies, by signing and submitting this bid proposal, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct:

Company: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

DISCLOSURE OF LOBBYING ACTIVITIES

COMPLETE THIS FORM TO DISCLOSE LOBBYING ACTIVITIES PURSUANT TO 31 U.S.C. 1352

1. Type of Federal Action:
- ☐ a. contract
- b. grant
- c. cooperative agreement
- d. loan
- e. loan guarantee
- f. loan insurance

2. Status of Federal Action:
- ☐ a. bid/offer/application
- b. initial award
- c. post-award

3. Report Type:
- ☐ a. initial
- b. material change

For Material Change Only:
year_____ quarter _____
date of last report _____

4. Name and Address of Reporting Entity

☐ Prime ☐ Subawardee
Tier_____, if known

Congressional District, if known

5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:

Congressional District, if known

6. Federal Department/Agency:

7. Federal Program Name/Description:

CFDA Number, if applicable _____

8. Federal Action Number, if known:

9. Award Amount, if known:

10. a. Name and Address of Lobby Entity
(If individual, last name, first name, MI)

b. Individuals Performing Services (including address if different from No. 10a)
(last name, first name, MI)

(attach Continuation Sheet(s) if necessary)

11. Amount of Payment (check all that apply)

$ _____ ☐ actual ☐ planned

12. Form of Payment (check all that apply):
- ☐ a. cash
- ☐ b. in-kind; specify: nature_____
  value _____

13. Type of Payment (check all that apply)
- ☐ a. retainer
- ☐ b. one-time fee
- ☐ c. commission
- ☐ d. contingent fee
- ☐ e deferred
- ☐ f. other, specify _____

14. Brief Description of Services Performed or to be performed and Date(s) of Service, including officer(s), employee(s), or member(s) contacted, for Payment Indicated in Item 11:

(attach Continuation Sheet(s) if necessary)

15. Continuation Sheet(s) attached: **Yes** ☐ **No** ☐

16. Information requested through this form is authorized by Title 31 U.S.C. Section 1352. This disclosure of lobbying reliance was placed by the tier above when his transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to Congress semiannually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Signature: _____

Print Name: _____

Title:_____

Telephone No.: _____Date: _____

Authorized for Local Reproduction
Standard Form - LLL

Federal Use Only:

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of covered Federal action or a material change to previous filing pursuant to title 31 U.S.C. section 1352. The filing of a form is required for such payment or agreement to make payment to lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress an officer or employee of Congress or an employee of a Member of Congress in connection with a covered Federal action. Attach a continuation sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence, the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last, previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District if known. Check the appropriate classification of the reporting entity that designates if it is or expects to be a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the first tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in Item 4 checks "Subawardee" then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organization level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identification in item 1 (e.g., Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract grant. or loan award number, the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitments for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.
    (b) Enter the full names of the individual(s) performing services and include full address if different from 10
    (c). Enter Last Name, First Name and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed or will be expected to perform and the date(s) of any services rendered. Include all preparatory and related activity not just time spent in actual contact with Federal officials. Identify the Federal officer(s) or employee(s) contacted or the officer(s) employee(s) or Member(s) of Congress that were contacted.
15. Check whether or not a continuation sheet(s) is attached.
16. The certifying official shall sign and date the form; print his/her name title and telephone number.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

CERTIFICATION REGARDING FOREIGN TRADE RESTRICTIONS

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

a. is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);
b. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list;
c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a contractor or subcontractor who is unable to certify to the above. If the contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project, the Federal Aviation Administration may direct through the Sponsor cancellation of the contract at no cost to the Government.

Further, the contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The contractor shall provide immediate written notice to the sponsor if the contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide written notice to the contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct through the Sponsor cancellation of the contract or subcontract for default at no cost to the Government.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

_____ _____

Date Signature

CERTIFICATION OF COMPLIANCE WITH FAA BUY AMERICAN PREFERENCE – CONSTRUCTION PROJECTS

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with its proposal. The bidder or offeror must indicate how it intends to comply with 49 USC § 50101, BABA and other related Made in America Laws, U.S. statutes, guidance, and FAA policies, by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e., not both) by inserting a checkmark (✓) or the letter X".

☐ Bidder or offeror hereby certifies that it will comply with 49 USC § 50101, BABA and other related U.S. statutes, guidance, and policies of the FAA by:

a. Only installing iron, steel, and manufactured products produced in the United States;
b. Only installing construction materials defined as: an article, material, or supply – other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives that are or consist primarily of non-ferrous metals; plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); glass (including optic glass); lumber or drywall that have been manufactured in the United States.
c. Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
d. Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

a. To provide to the Airport Sponsor or the FAA evidence that documents the source and origin of the iron, steel, and/or manufactured product.
b. To faithfully comply with providing U.S. domestic products.
c. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.
d. Certify that all construction materials used in the project are manufactured in the U.S.

☐ The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a) but may qualify for a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

a. To the submit to the Airport Sponsor or FAA within 15 calendar days of being selected as the responsive bidder, a formal waiver request and required documentation that supports the type of waiver being requested.
b. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination that may result in rejection of the proposal.

c. To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
d. To furnish U.S. domestic product for any waiver request that the FAA rejects.
e. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 2 Waiver (Nonavailability) - The iron, steel, manufactured goods or construction materials or manufactured goods are not available in sufficient quantity or quality in the United States. The required documentation for the Nonavailability waiver is:

a. Completed Content Percentage Worksheet and Final Assembly Questionnaire
b. Record of thorough market research, consideration where appropriate of qualifying alternate items, products, or materials including;
c. A description of the market research activities and methods used to identify domestically manufactured items capable of satisfying the requirement, including the timing of the research and conclusions reached on the availability of sources.

Type 3 Waiver – The cost of components and subcomponents produced in the United States is more than 60 percent of the cost of all components and subcomponents of the facility/project." The required documentation for a Type 3 waiver is:

a. a) Completed Content Percentage Worksheet and Final Assembly Questionnaire including;
b. Listing of all manufactured products that are not comprised of 100 percent U.S. domestic content (excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
c. Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
d. Percentage of non-domestic component and subcomponent cost as compared to total "facility" component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

Type 4 Waiver (Unreasonable Costs) – Applying this provision for iron, steel, manufactured goods or construction materials would increase the cost of the overall project by more than 25 percent. The required documentation for this waiver is:

a. A completed Content Percentage Worksheet and Final Assembly Questionnaire form
b. At minimum two comparable equal bids and/or offers;
c. Receipt or record that demonstrates that supplier scouting called for in Executive Order 14005, indicates that no domestic source exists for the project and/or component;
d. Completed waiver applications for each comparable bid and/or offer.

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

_____	_____
Date	Signature
_____	_____
Company Name	Title

STATE OF CALIFORNIA
DRUG-FREE WORKPLACE CERTIFICATION
STD. 21 (REV. 10/2019)

CERTIFICATION

I, the official named below, herby swear that I am duly authorized to legally bind the prospective contractor or grant recipient to the certification described below. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

CONTRACTOR/BIDDER FIRM NAME	FEDERAL ID NUMBER
BY *(Authorized Signature)*	DATE EXECUTED
PRINTED NAME AND TITLE OF PERSON SIGNING	TELEPHONE NUMBER (*Include Area Code)*
TITLE	
CONTRACTOR/BIDDER FIRM'S MAILING ADDRESS	

The contractor or grant recipient named above hereby certifies with Government Code Section 8355 in matters relating to providing a drug-free workplace. The above named contractor or grant recipient will:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).
2. Establish a Drug-Free Awareness Program as required by Government Code 8355(b), to inform employees about all of the following:
    a. The Dangers of drug abuse in the workplace,
    b. The person's or organization's policy in maintaining a drug-free workplace,
    c. Any available counseling, rehabilitation and employee assistance programs, and
    d. Penalties that may be imposed upon employees for drug abuse violations.
3. Provide as required by Government Code 8355(c), that everyone who works on the proposed contract or grant:
    a. Will receive a copy of the company's drug-free policy statement, and

b. Will agree to abide by the terms of the company's statement as a condition of employment on the contract or grant.

4. At the election of the contractor or grantee, from and after the "Date Executed" and until _____(NOT TO EXCEED 36 MONTHS), the state will regard this certificate as valid for all contracts or grants entered into between the contractor or grantee and this state agency without requiring the contractor or grantee to provide a new individual certificate for each contract or grant. If the contractor or grantee elects to fill in the blank date, then the terms of this certificate shall have the same force, meaning, effect and enforceability as if a certificate were separately, specifically, and individually provided for each contract or grant between the contractor or grantee and this state agency.

CERTIFICATION OF OFFERER/BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications

1. The applicant represents that it is ( ) is not ( ) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
2. The applicant represents that it is ( ) is not ( ) is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty-four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

_____	_____
Date	Signature
_____	_____
Company Name	Title

CERTIFICATION REGARDING DOMESTIC PREFERENCES FOR PROCUREMENTS

(DOMESTIC PREFERENCES FOR PROCUREMENTS, A28.1 SOURCE, 2 CFR § 200.322, 2 CFR Part 200, Appendix II(L))

Must be included in all subawards, including all contracts and purchase orders for work or products under the grant.

The Bidder or Offeror certifies by signing and submitting this bid or proposal that, to the greatest extent practicable, the Bidder or Offeror has provided a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including, but not limited to, iron, aluminum, steel, cement, and other manufactured products) in compliance with 2 CFR § 200.322.

_____ _____

Signature Title

_____

Date

BIDDER'S STATEMENT ON PREVIOUS CONTRACTS

SUBJECT TO EEO CLAUSE

(REFERENCE 41 CFR § 60-1.4, EXECUTIVE ORDER 11246)

Each bidder, prospective prime contractor, and proposed subcontractor must complete the following form:

The Bidder (Proposer) shall complete the following statement by checking the appropriate boxes.

The Bidder (Proposer) has _____ has not ____ participated in a previous contract subject to the equal opportunity clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.

The Bidder (Proposer) has _____ has not _____ submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed subcontractors will be obtained prior to award of subcontracts.

If the Bidder (Proposer) has participated in a previous contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the Bidder (Proposer) shall submit a compliance report on Standard Form 100, "Employee Information Report EEO -1", prior to the award of contract.

_____ _____

Signature Title

_____

Date

CERTIFICATION OF BIDDER REGARDING AFFIRMATIVE ACTION PROGRAM

(REFERENCE: 41 CFR PART 60-4, EXECUTIVE ORDER 11246)

The bidder hereby certifies that he or she is in compliance with the Civil Rights Act of 1964, Executive Order No. 11246, Employment Practices Act, and any other applicable Federal and State laws and regulations relating to equal opportunity employment.

Bidder's Name: _____

Address: _____

Printed Name: _____

Title: _____

_____ _____

Date Signature

BIDDER'S CHECKLIST

for

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12

CONTRACT NO. 330046

For bid to be considered "responsive" the following documents are required to be fully executed and submitted with your bid. **Initial each line item.**

1. _____ Bidder's Checklist
2. _____ Proposal Form (Includes Contractor License Information and DIR Registration Number)
3. _____ Acknowledgement of receipt of addendum (if applicable)
4. _____ Executed Bidder's Signature Page
5. _____ Bid Item List of bid prices that state the bid as intended
6. _____ Designation of Subcontractors Form
7. _____ Fleet Compliance Certification
8. _____ Bidder's Information List
9. _____ Bidder's Equal Employment Opportunity Certification
10. _____ Subcontractor's Equal Employment Opportunity Certification
11. _____ Certification of Non-Segregated Facilities
12. _____ Declaration of Noncollusion
13. _____ Debarment and Suspension Requirements Certification
14. _____ Public Contract Code Sections 10162 Questionnaire, Public Contract Code Section 10232 Statement, and 10285.1 Statement,
15. _____ Iran Contracting Act Certification
16. _____ Non-Lobbying Certification for Federal-Aid Contracts
17. _____ Disclosure of Lobbying Activities
18. _____ Certification Regarding Foreign Trade Restrictions
19. _____ Certification of Compliance with FAA of Buy American Preference – Construction Projects
20. _____ State of California Drug-Free Workplace Certification
21. _____ Certification of Offerer/Bidder Regarding Tax Delinquency and Felony Convictions
22. _____ Certification Regarding Domestic Preferences for Procurements

23. _____ Bidder's Statement on Previous Contract Subject to EEO clause
24. _____ Certification of Bidder Regarding Affirmative Action Program
25. _____ Bidder's Bond – Each bidder shall submit with bid, bid bond (Surety bond in the amount not less than 10% of the total bid

BIDDER IS ALSO REQUIRED TO SUBMIT THE FOLLOWING WRITTEN STATEMENTS OF QUALIFICATIONS AT THE TIME OF BID.

26. _____ Evidence of Competency

    Each Bidder shall submit "evidence of competency" to the Owner at the time of bid opening (see FAA General Contract Provisions Section 20-02 of the project specifications for details).

27. _____ Evidence of Financial Responsibility

    Each Bidder shall submit "evidence of Financial Responsibility" to the Owner at the time of bid opening (see FAA General Contract Provisions Section 20-02 of the project specifications for details).

Name of Bidder_____

Signature of Bidder_____

Printed Name and Title_____

Date_____

The **successful bidder** will be required to provide the following **after** notice of award:

- Signed Contract
- Performance Bond (100%)
- Payment Bond (100%)

BIDDER'S BOND

KNOW ALL BY THESE PRESENTS:

That we, _____

_____

as Principal, and _____

_____,

as Surety, are held and firmly bound unto the County of San Luis Obispo, State of California (hereinafter called "County") in the penal sum of Ten Percent (10%) of the total aggregate amount of the bid of the Principal above named, submitted by said Principal to the County for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. In no case shall the liability of the Surety hereunder exceed the sum of _____

_____ ($_____).

THE CONDITION OF THIS OBLIGATION IS SUCH,

That whereas a bid to County for certain construction specifically described as follows, for which bids are to be opened on _____, 20_____, has been submitted by Principal to County for:

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

NOW, THEREFORE, the penal sum guaranteed by this bond shall be forfeited to the County in the event of any of the following:

(1) The aforesaid Principal withdraws said bid after the time fixed in the Notice to Bidders for the opening of bids; or,

(2) Principal fails, within five (5) business days after receipt of written notice that the contract has been awarded to Principal, to, enter into a written contract with County, in the prescribed form, in accordance with the bid as accepted, and file with the County the certificates of insurance as stipulated in section 7-1.06 of the General Conditions and the two bonds (in the prescribed forms), one to guarantee faithful performance and the other to guarantee payment for labor and materials.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said contract or to the work to be performed thereunder or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

In the event suit is brought upon said bond by County and judgment is recovered, the Surety shall pay all costs incurred by County in such suit, including a reasonable attorney's fee to be fixed by the court. Death of the Principal shall not relieve Surety of its obligations hereunder.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____

day of_____, 20_____.

_____ (Seal)

_____ (Seal)

_____ (Seal)

Principal

_____ (Seal)

_____ (Seal)

_____ (Seal)

Surety

_____

_____

Address

NOTE: Signatures of those executing for Surety must be properly acknowledged.

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

AGREEMENT

FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

COUNTY OF SAN LUIS OBISPO

AGREEMENT

THIS IS AN AGREEMENT, made and entered into by between the County of San Luis Obispo, a political subdivision and county of the State of California, party of the first part, hereinafter called "County" and _____

_____

the party of the second part, hereinafter called "Contractor".

WITNESSETH, that for and in consideration of the mutual covenants and agreements hereinafter contained, the parties hereto agree as follows:

ARTICLE 1 WORK

The Contractor shall, at its own proper cost and expense, do all the work and furnish all the equipment and materials necessary to construct and complete in good and workmanlike manner to the satisfaction of the County, for

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

all in strict accordance with the Contract Documents.

ARTICLE 2 CONTRACT

This Agreement, together with all other Contract Documents, including without limitation Notice to Bidders, Instructions to Bidders, Bid Forms, General Conditions, Specifications, Appendices, Plans, and all addenda thereto, form the Contract, and said documents by this reference become as fully a part of this Agreement as if set forth in full and are herein sometimes referred to as “Contract” or as “Contract Documents”.

ARTICLE 3 CONTRACT TIME AND LIQUIDATED DAMAGES

The Contractor shall begin work within 10 working days from the date of receipt of County's Notice to Proceed.

The work shall be diligently prosecuted to completion before the expiration of 270 working days from the date of receipt of the County’s Notice to Proceed.

It is agreed by the parties to the contract that in the case all the work called for under the contract in all parts and requirements is not finished or completed within the number of working days as set forth in this Agreement, damage will be sustained by the County of San Luis Obispo, and that it is and will be impractical and extremely difficult to ascertain and determine the actual damage which the County will sustain in the event of and by reason of such delay; and it is therefore agreed that the Contractor will pay to the County of San Luis Obispo the sum of FIVE THOUSAND DOLLARS ($5,000.00) per day for each and every calendar days delay in finishing the work in excess of the number of working days prescribed above as liquidated and agreed damages; and the Contractor agrees to pay said liquidated damages herein provided for, and further agrees that the County may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

ARTICLE 4 CONTRACT PRICE

The Contract Price is the total aggregate amount of the Contractor's bid price based on the estimated quantities listed in the Bid Item List and as set forth in the award of the Contract approved by the County, subject to any adjustments for variances in quantities and changes pursuant to change orders executed in accordance with the Contract Documents. The estimated quantities listed in the Bid Item List will not govern final payment. The Contractor will receive and accept, and the County will pay the Unit Prices and lump sum prices only for actual quantities of installed items constructed in accordance with the Contract Documents specified in the attached Bid Item List, which is incorporated herein by reference as Exhibit A, as full compensation for the Contractor's full performance of the Contract including furnishing all labor, materials, and equipment for doing all the work contemplated and embraced in this Agreement. Upon completion of the work, if the actual installed quantities show either an increase or decrease from the estimated quantities in the Bid, the Contract Unit Prices (including lump sum prices) will prevail except as otherwise specified in the Contract Documents.

To the extent permitted by law, the Contractor assumes during the progress of the work and before its acceptance, any and all loss or damage arising out of the nature of the work aforesaid or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by the County; and assumes any and all expenses incurred by or in consequence of the suspension or discontinuance of work, for well and faithfully completing the work, and the whole thereof, in the manner and to the requirements of the Contract Documents.

ARTICLE 5 SUBCONTRACTING

The Contractor is directed to the provisions of the "Subletting and Subcontracting Fair Practices Act" set forth in Public Contract Code sections 4100-4114.

ARTICLE 6 FINAL PAYMENT

Final payment for the work performed under this Contract shall be made as specified in section 9-1.17 "Final Payment," of the General Conditions and no payment shall be construed to be an acceptance of any defective work or improper materials. The Contractor further agrees that acceptance by the Contractor of the final payment due under this Contract, and the adjustment and payment of its bill rendered for any work done in accordance with any amendments of this Contract, shall be and shall operate as a release to the County of San Luis Obispo from any and all claims or liabilities on account of work performed under this Contract except claims for which written notice of claim has been properly provided to the County in accordance with the claims procedures set forth in the General Conditions. Besides guarantees required elsewhere, the Contractor shall and does hereby guarantee all workmanship and material and will correct any defects in the work for a period of one year from and after both the date of acceptance of the work and the recordation of the notice of completion by the County and shall repair or replace any or all work and material, together with any other portions of the work which may be displaced in so doing, that in the opinion of the County is or becomes defective during the period of said guarantee without expense whatsoever to the County. It is mutually agreed between the parties hereto, that no certificate given or payments made under this Contract, including final payment, shall be evidence of the performance of this Contract, either wholly or in part, against any claim of the Contractor.

ARTICLE 7 CONTRACTOR'S REPRESENTATIONS

The Contractor hereby declares that he/she has read the Contract Documents pertaining to the work to be accomplished hereunder, has carefully examined the plans and detail drawings of the work to be performed and fully understands the intent and meaning of the same.

It is further stipulated and agreed that the Contractor shall keep himself/herself fully informed of all laws, ordinances, and regulations which do or may affect the conduct of the work, the materials used therein or persons engaged or employed thereupon and all such orders of bodies and tribunals having any jurisdiction over the same. If it be found that the General Conditions, Special Provisions, or Standard Specifications for the work conflict with any such law, ordinance, or regulation the Contractor shall immediately report same to the Public Works Director in writing. The Contractor shall at all times observe and comply with and shall cause all its agents, employees, and independent contractors hired by the Contractor to observe and comply with all such existing and future laws, ordinances, regulations, or decrees.

ARTICLE 8 APPRENTICES

Attention is directed to the provisions in Labor Code sections 1777.5, 1777.6, and 1777.7, concerning the employment of apprentices by the Contractor or any Subcontractor.

The Contractor and any Subcontractor shall comply with the requirements of Labor Code sections 1777.5, 1777.6, and 1777.7, in the employment of apprentices.

To ensure compliance and complete understanding of the law relating to apprentices, and specifically the required ratio thereunder, each Contractor or Subcontractor should, where some question exists, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California, or one of its branch offices prior to commencement of work on this Contract. Responsibility for compliance with said Labor Code sections lies with the Contractor.

ARTICLE 9 PAYROLL RECORDS

Attention is directed to the provisions in Labor Code section 1776 and section 7-1.02K(3), "Certified Payroll Records," of the General Conditions concerning Contractor and Subcontractor payroll records.

The Contractor and any Subcontractor shall comply with the requirements of Section 1776 of the Labor Code and section 7-1.02K(3), "Certified Payroll Records," of the General Conditions.

The Contractor and all Subcontractors shall furnish electronic certified payroll records directly to the Labor Commissioner (Division of Labor Standards Enforcement). Additionally, the Contractor shall submit certified payroll records to the County on a weekly basis, unless directed otherwise by the County. In addition, the Contractor must post job site notices prescribed by regulations.

ARTICLE 10 EQUAL OPPORTUNITY CLAUSE

During the performance of this Contract, the Contractor agrees to comply with all of the Equal Employment Opportunity provisions of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor Regulations (41 CFR 60-1.4), including the following:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex,

sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Department of Public Works setting forth the provisions of this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.
4. The Contractor will send to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Department of Public Works, advising the said labor union or workers' representatives of the Contractor's commitments under this Article, and shall post copies of the Notice in conspicuous places available to employees and applicants for employment.
5. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his/her books, records, and accounts by the County of San Luis Obispo and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
8. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. The Contractor will take such action with respect

to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided,* that if the applicant so participating is a state or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

ARTICLE 11 SAFETY

All work conducted by the Contractor and/or Subcontractors in the execution of this contract shall be in accordance with current CAL OSHA requirements and section 7-1.02K(6), “Occupational Safety and Health Standard,” of the General Conditions

ARTICLE 12 EMISSIONS REDUCTION

During the performance of this Contract, Contractor agrees to comply with Emissions Reduction.

Contract signing constitutes submittal of the following certification:

I am aware of the emissions reduction regulations being mandated by the California Air Resources Board. I will comply with such regulations before commencing the performance of the work and maintain compliance throughout the duration of this Contract.

ARTICLE 13 BONDS

In case suit is brought upon Contractor's payment or performance bond, then said surety will pay a reasonable attorneys' fee to be fixed by the court. Contractor and surety agree that neither the payment bond nor the performance bond shall be considered a part of the Contract. Contractor and surety further agree that the payment and performance bonds are separate obligations of the Contractor and its surety, and that any attorneys' fee provision contained in the payment and performance bonds shall not apply to the Contract. In the event there is any litigation between the parties arising from the breach of the Contract, each party will bear its own attorneys' fees in the litigation.

ARTICLE 14 ATTORNEYS FEES

No provisions of the Contract Documents provide either the Contractor or the County the right to be awarded any attorney's fees and/or costs under Civil Code section 1717 in any legal action brought by either party to enforce any provision of the Contract Documents against the other party. The parties agree that any references to attorney's fees in language describing indemnification obligations do not constitute a contractual provision that would provide either the Contractor or the County the right to be awarded any attorney's fees and/or costs under Civil Code section 1717 in any legal action brought by either party to enforce any provision of the Contract Documents against the other party. Any other language in the Contract Documents providing for a recovery of attorney's fees shall be strictly construed as not including the recovery of any attorney's fees incurred by either Contractor or County in any legal action brought by either party to enforce any provision of the Contract Documents against the other party.

The parties agree that the Contract Documents contain no provisions that would allow either the Contractor or the County to be awarded attorney's fees and/or costs under Civil Code section 1717. Nothing in this Article affects any right by Contractor or County to recover attorney's fees or costs by operation of any law other than Civil Code section 1717.

In the event of any conflict between language in this Article and any other language in the Contract Documents, the language in this Article shall prevail.

ARTICLE 15 NONDISCRIMINATION

During the performance of this Contract, Contractor agrees to comply with the following provisions of 2 CA Code of Regulations section 11105:

1. In the performance of this Contract, Contractor shall not deny the Contract's benefits to any person on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination.
2. Contractor, its contractor(s) and all Subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code section 12900 et seq.), the regulations promulgated thereunder (California Code of Regulations, Title 2, section 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Gov.

Code, §§ 11135-11139.5), and the regulations or standards adopted by the County to implement such article.

3. Contractor and its Subcontractors shall permit access by representatives of the Department of Fair Employment and Housing and the County upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, and all other sources of information and its facilities as said Department or County shall require to ascertain compliance with this clause.
4. Contractor and its Subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
5. Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Contract.

ARTICLE 16 ACCESS TO RECORDS

The Contractor agrees to provide County, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed. The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

In compliance with section 1225 of the Disaster Recovery Reform Act of 2018, the County and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

ARTICLE 17 FAIR EMPLOYMENT PRACTICES

1. In the performance of this Agreement, Contractor will not discriminate against any employee for employment because of race, color, sex, sexual orientation, religion, ancestry or national origin, physical disability, medical condition, marital status, political affiliation, family and medical care leave, pregnancy leave, or disability leave. Contractor will take affirmative action to ensure that employees are treated during employment without regard to their race, sex, sexual orientation, color, religion, ancestry, or national origin, physical disability, medical condition, marital status, political affiliation, family and medical care leave, pregnancy leave, or disability leave. Such action shall include, but not be limited to, the following: employment; upgrading; demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor shall post in conspicuous places, available to employees for employment, notices to be provided by the County setting forth the provisions of this article.
2. Contractor, its contractor(s) and all Subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900(a-f), set forth in Chapter 5 of

Division 4 of Title 2 of the California Code of Regulations are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Each of the Contractor's contractors and all Subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreements, as appropriate.

3. Contractor shall include the nondiscrimination and compliance provisions of this clause in all contracts and subcontracts to perform work under this Agreement.
4. Contractor will permit access to the records of employment, employment advertisements, application forms, and other pertinent data and records by the County, the California Department of Transportation, the State Fair Employment and Housing Commission, or any other agency of the State of California designated by California Department of Transportation, for the purposes of investigation to ascertain compliance with this article.
5. Remedies for Willful Violation:
    a. The County may determine a willful violation of the Fair Employment provision to have occurred upon receipt of a final judgment to that effect from a court in an action to which Contractor was a party, or upon receipt of a written notice from the Fair Employment and Housing Commission that it has investigated and determined that Contractor has violated the Fair Employment Practices Act and had issued an order under Labor Code Section 1426 which has become final or has obtained an injunction under Labor Code Section 1429.
    b. For willful violation of this Fair Employment Provision, the County shall have the right to terminate this Agreement either in whole or in part, and any loss or damage sustained by the County in securing the goods or services thereunder shall be borne and paid for by Contractor and by the surety under the performance bond, if any, and the County may deduct from any moneys due or thereafter may become due to Contractor, the difference between the price named in the Agreement and the actual cost thereof to the County to cure Contractor's breach of this Agreement.

ARTICLE 18 CONTRACTORS LICENSE NOTICE

Contractors are required by law to be licensed and regulated by the Contractors State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors State License Board, P.O. Box 26000, Sacramento, California 95826.

ARTICLE 19 WORKERS COMPENSATION CERTIFICATION

In accordance with California Labor Code §§ 1860, 1861, and 3700, every Contractor will be required to secure the payment of compensation to its employees. By signing below, Contractor certifies as follows: "I am aware of the provisions of Labor Code Section 3700, which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract."

ARTICLE 20 COMPLIANCE WITH IMMIGRATION REFORM AND CONTROL ACT OF 1986

The Contractor is solely and exclusively responsible for employment of individuals for the work of the Contract in conformity with the Immigration Reform and Control Act of 1986, 8 USC § 1101 et seq. (the "IRCA"), the Contractor shall also require that any Subcontractor, person, or entity employing labor in connection with any of the work of the Contract shall so similarly comply with the IRCA.

ARTICLE 21 USE OF UNITED STATES – FLAG VESSELS

The Contractor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carries, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
2. To furnish within 20 days following the date of loading for shipments originating within the United State or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated "on-board" commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (1) of this section to both the Contracting Officer (through the Contractor in the case of Subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
3 To insert the substance of the provisions of this section in all subcontracts issued pursuant to this Contract.

ARTICLE 22 CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7674q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387) and will report violations to FEMA and the Regional Office of the Environmental Protection Agency.

ARTICLE 23 RECYCLING

During the performance of this contract, Contractor agrees to comply with the "California Integrated Waste Management Act" as prescribed in the County's Recycling Requirements and recycle at least 75% of construction and demolition waste generated by the project. The Recycling Requirements are available on the following County website:

https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Design.aspx

ARTICLE 24 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT REQUIREMENTS

1. Overtime Requirements.

   No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; Liability for Unpaid Wages; Liquidated Damages.

   In the event of any violation of the clause set forth in paragraph 1 of this Article the Contractor and any Subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this Article, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this Article.

3. Withholding for Unpaid Wages and Liquidated Damages.

   The Federal Emergency Management Agency or the County of San Luis Obispo shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or Subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or Subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this Article.

4. Subcontracts.

   The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraph 1 through 4 of this Article and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any Subcontractor or lower tier Subcontractor with the clauses set forth in paragraphs 1 through 4 of this Article.

ARTICLE 25 FALSE CLAIMS AND STATEMENTS

The Contractor acknowledges that 31 U.S.C. Chapter 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this Agreement.

ARTICLE 26 PROCUREMENT OF RECOVERED MATERIALS

In accordance with 2 CFR §200.322, the Contractor shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) in 40 CFR 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

ARTICLE 27 PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS EQUIPMENT OR SERVICES

A. *Definitions.* As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming;

substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy 405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause.

B. *Prohibitions.*

1. Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug.13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

2. Unless an exception in paragraph (C) of this clause applies, the Contractor and its Subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to:

   i. Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

   ii. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

   iii. Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or

   iv. Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

C. *Exceptions.*

1. This clause does not prohibit contractors from providing:

   i. A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or

   ii. Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

2. By necessary implication and regulation, the prohibitions also do not apply to:

   i. Covered telecommunications equipment or services that:

      a. Are *not used* as a substantial or essential component of any system; *and*

      b. Are *not used* as critical technology of any system.

ii. Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.

D. *Reporting Requirement.*

1. In the event the Contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the Contractor is notified of such by a Subcontractor at any tier or by any other source, the Contractor shall report the information in paragraph (D)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.

2. The Contractor shall report the following information pursuant to paragraph (D)(1) of this clause:

i. Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

ii. Within 10 business days of submitting the information in paragraph (D)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the Contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services.

E. *Subcontracts.* The Contractor shall insert the substance of this clause, including this paragraph (E), in all subcontracts and other contractual instruments.

ARTICLE 28 ADVANCED CLEAN FLEETS

Vehicles with a GVWR greater than 8,500 lbs. and light-duty package delivery vehicles operated in California may be subject to the California Air Resources Board Advanced Clean Fleets regulations. Such vehicles may therefore be subject to requirements to reduce emissions of air pollutants. For more information, please visit the CARB Advanced Clean Fleets webpage at https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets. All fleets hired by the County shall be listed on the CARB Advanced Clean Fleets webpage as a compliant fleet or the fleet owner must provide a signed statement that its fleet is not subject to the High Priority and Federal Fleets regulations in title 13, CCR, sections 2015 through 2015.6 and the State and Local Government Fleets regulations in title 13, CCR, sections 2013 through 2013.4.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands the year and date first above written, being authorized thereto.

COUNTY OF SAN LUIS OBISPO

By:_____
Chairperson of the Board of Supervisors

Date:_____

ATTEST:
MATT PONTES
Ex-Officio Clerk of the Board of Supervisors

By:_____
Deputy Clerk

Date:_____

APPROVAL RECOMMENDED
JOHN DIODATI

By:_____
Director of Public Works

Date: 7/2/26

APPROVED AS TO FORM AND LEGAL EFFECT:
JON ANSOLABEHERE
County Counsel

By:_____
Chief Deputy County Counsel

Date: July 1, 2026

CONTRACTOR

_____

By:_____

Date:_____

_____
Printed Name and Title (President/CEO/Vice President)
(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign)

By:_____

_____
Printed Name and Title (Secretary/Assistant Secretary/CFO/Assistant Treasurer)

Date:_____

Address for giving notices:

_____

_____

_____

EXHIBIT A - BID ITEM LIST

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

BOND FORMS

FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

PERFORMANCE BOND

KNOW ALL BY THESE PRESENTS:

THAT WHEREAS, COUNTY OF SAN LUIS OBISPO (hereinafter referred to as "County"), has awarded to _____(hereinafter referred to as the "Contractor") a contract for AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12 (hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we, _____, the undersigned Contractor and _____ as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the County in the sum of _____ DOLLARS, ($_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless the County, its officers and agents, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees including reasonable attorney's fees, incurred by County in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by County, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the County from loss or damage resulting from or caused by defective materials or faulty workmanship, the above obligation in penal sum thereof shall remain in full force and effect. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the County's rights or the Contractor or Surety's obligations under the Contract, law, or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

Whenever Contractor shall be, and is declared by the County to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the County's option:

1. Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or

2. Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and the County, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the Contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the County under the Contract and any modification thereto, less any amount previously paid by the County to the Contractor and any other set offs pursuant to the Contract Documents.

3. Permit the County to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of

the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the County under the Contract and any modification thereto, less any amount previously paid by the County to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the County may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the County, when declaring the Contractor in default, notifies Surety of the County's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____,20____.

(Corporate Seal)

_____
Contractor/Principal

By: _____

Title: _____

(Corporate Seal)

_____
Surety

By: _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate)

Title: _____

The rate of premium on this bond is _____ per thousand.

The total amount of premium charges, $_____.
(The above must be filled in by corporate attorney)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____

_____

_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____

_____

_____

_____

(Telephone number of Surety and Agent or Representative for service of process in California) _____

_____

_____

NOTARY ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF _____

On _____, 20_____, before me, _____, Notary Public,

personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General

☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name of Person(s) or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

NOTARY ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF _____

On _____, 20_____, before me, _____, Notary Public,

personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General

☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name of Person(s) or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-In-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

PAYMENT BOND

KNOW ALL BY THESE PRESENTS:

THAT WHEREAS, COUNTY OF SAN LUIS OBISPO (hereinafter designated as the "County"), has awarded to _____ (hereinafter designated as the "Principal") a contract for the work described as follows: AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12 (the "Project"); and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and _____ as Surety, are held and firmly bound unto the County in the penal sum of _____ Dollars ($_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 9100 of the Civil Code, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his or its subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified, and also, in case suit is brought upon this bond, all litigation expenses incurred by the

County in such suit, including reasonable attorneys' fees, court costs, expert witness fees and investigation expenses.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or attempted rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or County and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 9100 of the Civil Code, and has not been paid the full amount of his or its claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed unoriginal thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____ 20_____ the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

(Corporate Seal)

_____
Contractor/Principal

By: _____

Title: _____

(Corporate Seal)

_____
Surety

By: _____
Attorney-in-Fact

(Attach Attorney-in-Fact Certificate) Title: _____

The rate of premium on this bond is _____ per thousand.

The total amount of premium charges, $_____.

(The above must be filled in by corporate attorney)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____

_____

_____

(Name and Address of Agent or _____

Representative for service of _____

process in California, if different _____

from above) _____

(Telephone number of Surety and _____

Agent or Representative for service _____

of process in California _____

Note: Appropriate Notarial Acknowledgements of Execution by Contractor and surety and a power of Attorney MUST BE ATTACHED.

NOTARY ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF _____

On _____, 20_____, before me, _____, Notary Public,

personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General

☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name of Person(s) or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for Contractor/Principal.

NOTARY ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF _____

On _____, 20_____, before me, _____, Notary Public,

personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public _____

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

☐ Individual
☐ Corporate Officer

_____
Title(s)

☐ Partner(s) ☐ Limited ☐ General

☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name of Person(s) or Entity(ies)

_____
_____

DESCRIPTION OF ATTACHED DOCUMENT

_____
Title or Type of Document

_____
Number of Pages

_____
Date of Document

_____
Signer(s) Other Than Named Above

NOTE: This acknowledgment is to be completed for the Attorney-In-Fact. The Power-of-Attorney to local representatives of the bonding company must also be attached.

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

GENERAL CONDITIONS

FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

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SIGNATURES

The Contract Documents for the AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12 CONTRACT NO. 330046 presented herein have been prepared by or under the direction of the following registered engineers:

Technical Specifications prepared by:

SEE PAGES FAA - 418-419

Registered Civil Engineer — Date

General Conditions prepared by:



Supervising Design Engineer — **7/1/26** Date

Contract Documents Approved and Adopted By:

Director of Public Works — 7/2/26 Date

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1 GENERAL

1-1.01 GENERAL

1-1.01A ORGANIZATION

Division I (General Provisions) of the Caltrans Standard Specifications is superseded by these County General Conditions. While the County General Conditions may appear to be similar to the Caltrans 2018 Standard Specifications, Division I, General Provisions, in some respects, they are not the same. Bidders and the Contractor are advised to read these County General Conditions carefully, and to not assume that provisions that are similar to Caltrans provisions are actually the same as Caltrans. It is the responsibility of all bidders to read and understand the County General Conditions before submitting a Bid.

The bid items set forth the construction specifications that apply. The first 2 digits of a bid item code correspond to the specification section number with the same 2 first digits except for bid item code 999990 that corresponds to section 9 and unless shown otherwise in the table titled "Bid Items and Applicable Sections" in the Special Provisions.

1-1.01B INTERPRETATION

The specifications are written to the bidder before award and the Contractor after. Before award, interpret sentences written in the imperative mood as starting with "The bidder must" and interpret "you" as "the bidder" and "your" as "the bidder's." After award, interpret sentences written in the imperative mood as starting with "The Contractor must" and interpret "you" as "the Contractor" and "your" as "the Contractor's."

1-1.01C COMMUNICATIONS

After Contract approval, submit documents and direct questions to the Engineer. Orders, authorizations, and requests to the Contractor are by the Engineer.

The following items from the County are in writing:

1. Approvals
2. Authorizations
3. Decisions
4. Notifications
5. Orders
6. Responses

The following items from the Contractor must be in writing:

1. Notifications
2. Proposals
3. Reports
4. Requests, including RFIs, sequentially numbered
5. Subcontracts
6. Test results

Where a location is not specified with the words "shown," "specified," or "described" interpret:

1. "Shown" as "shown on the plans."
2. "Specified" as "specified in the specifications."
3. "Described" as "described in the Contract." "Described" means "shown, specified, or both."

Headings are included for the purposes of organization and referencing. Inclusion of a heading with no related content, "Not Used," or "Reserved" does not indicate that no specification exists for that subject; applicable specifications may be covered in a general or referenced specification.

Specifications in a section title *General* apply to all subordinate sections within the section.

Specifications in the general section of a division apply to all sections within the division.

The specifications are expressed in U.S. customary units except where a referenced document uses the International System of Units as the standard.

Unless an object or activity is specified to be less than the total, the quantity or amount is all of the object or activity.

All items in a list apply unless the items are specified as choices.

1-1.01D SEVERABILITY

In the event any Article, Section, Sub-article, Paragraph, Subparagraph, sentence, clause, or phrase contained in the Contract Documents shall be deemed, determined, declared, or adjudged invalid, illegal, unconstitutional, void or otherwise unenforceable such provision or clause shall be deemed to be severed and deleted from the Contract Documents and all remaining provisions shall continue in full force and effect.

1-1.01E PROVISIONS DEEMED INSERTED

Each and every provision of law and clause required to be inserted in the Contract Documents shall be deemed to be inserted herein and the Contract Documents shall be read and enforced as though such provision or clause is included herein, and if through mistake, or otherwise, any such provision is not inserted or not correctly inserted, then upon application of either party, the Contract Documents shall forthwith be physically amended to make such insertion or correction.

1-1.01F HEADINGS NOT CONTROLLING

The various headings contained in the Contract Documents are inserted for convenience only and shall not affect the meaning or interpretation of the Contract or any provision thereof.

1-1.01G NEUTRAL INTERPRETATION

The Contract Documents shall be construed neither against nor in favor of either party but shall be construed in a neutral manner.

1-1.02–1-1.04 RESERVED

1-1.05 REFERENCES

A reference within parentheses to a law or regulation is included in the Contract for convenience only and is not a comprehensive listing of related laws and regulations. Lack of a reference does not indicate no related laws or regulations exist.

Where the version of a referenced document is not specified, use the current version in effect on the date of the Notice to Bidders.

A reference to a section includes the specifications in the sections titled General that apply to the section.

Where a section number is referenced without a reference to a document, the reference is to a section of the General Conditions (sections 1-9) or the Standard Specifications (sections 10 -94)

as revised by any revised standard specification, special provision, or both. Any reference to a revised standard specification section is for convenience only. Lack of direct reference to a revised standard specifications section does not indicate a revised standard specification for the section does not exist.

A code not specified as a federal code is a California code.

An agency or department not specified as a federal or local agency or department is a California agency or department.

1-1.06 ABBREVIATIONS

Unless context indicates otherwise, interpret the meaning of an abbreviation used in the specifications and the Bid Item List as shown in the following table:

Abbreviations

Abbreviation	Meaning
AASHTO	American Association of State Highway and Transportation Officials
AB	aggregate base
ACI	American Concrete Institute
ADL	aerially deposited lead
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMA	archaeological monitoring area
ANSI	American National Standards Institute
APCD	Air Pollution Control District
API	American Petroleum Institute
AQMD	Air Quality Management District
AREMA	American Railway Engineering and Maintenance-of-Way Association
AS	aggregate subbase
ASME	American Society of Mechanical Engineers
ASQ	American Society for Quality
ATPB	asphalt treated permeable base
ATS	active treatment system
AWG	American Wire Gauge
AWIS	automated work zone information system
AWPA	American Wood Protection Association
AWS	American Welding Society[a]
AWWA	American Water Works Association
BBS	battery backup system
BNSF	Burlington Northern Santa Fe
Cal/OSHA	California Division of Occupational Safety and Health Administration
CBC	California Building Code
CDPH	California Department of Public Health
CIDH	cast-in-drilled-hole
CIH	Certified Industrial Hygienist
CIP	cast in place
CISS	cast-in-steel shell
CJP	complete joint penetration
CMU	concrete masonry unit
CPM	critical path method
CPL	composite plastic lumber
CRCP	continuously reinforced concrete pavement
CRM	crumb rubber modifier
CSC	Conductor signal cable
CSL	crosshole sonic logging
CSS	Cement stabilized soil
CTB	cement treated base
CTPB	cement treated permeable base
CVN	Charpy V-notch
CWI	AWS Certified Welding Inspector

DBE	Disadvantaged Business Enterprise
DRA	Dispute Resolution Advisor
DRB	Dispute Resolution Board
DTSC	Department of Toxic Substances Control
DVBE	Disabled Veteran Business Enterprise
ECTC	Erosion Control Technology Council
EIA/ECIA	Electronic Industries Alliance/Electronic Components Industry Association
ELAP	Environmental Laboratory Accreditation Program
ESA	environmentally sensitive area
ETL	Electrical Testing Laboratories
f_c	extreme fiber compressive stress in concrete at service loads
f'_c	compressive strength of concrete
FDR	full depth reclamation
GAAP	Generally Accepted Accounting Principles
GGBFS	ground granulated blast furnace slag; slag cement
GGL	gamma-gamma logging
GSP	galvanized steel pipe
HMA	hot mix asphalt
HMA-O	hot mix asphalt (open graded)
HS	high strength
ICC	International Code Council
ICEA	Insulated Cable Engineers Association
ITE	Institute of Transportation Engineers
IEEE	Institute of Electrical and Electronics Engineers
JMF	job mix formula
JPCP	jointed plain concrete pavement
ksf	kips per square foot
ksi	kips per square inch
LCB	lean concrete base
LCS	Department's lane closure system
LEED	Leadership in Energy and Environmental Design
LOTB	log of test boring
LTDS	long term design strength
MC	medium curing
METS	Caltran's Materials Engineering and Testing Services
MPI	Master Painters Institute
MPQP	Material Plant Quality Program published by Caltrans
MR	movement rating
MSDS[b]	material safety data sheet
MT	magnetic particle testing
MUTCD	*Manual on Uniform Traffic Control Devices*
NAL	numeric action level
NDT	nondestructive testing
NEL	numeric effluent limitation
NETA	International Electrical Testing Association
NEC	National Electrical Code

NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NMAS	nominal maximum aggregate size
NPDES	National Pollutant Discharge Elimination System
NPT	National Pipe Thread Taper
NRTL	Nationally Recognized Testing Laboratory
NTU	nephelometric turbidity unit
OBC	optimum binder content
OGFC	open graded friction course
OSD	Offices of Structure Design
PCMS	portable changeable message sign
PLAC	permit, license, agreement, certification, or any combination of these
PC	Precast
PCC	portland cement concrete
pcf	pounds per cubic foot
PG	performance grade
PI_0	zero blanking band profile index
PJP	partial joint penetration
POC	pedestrian overcrossing
PQR	procedure qualification record
PS	Prestressed
PSF	pedestrian signal face
PV	programmed visibility
QA	quality assurance
QAP	Quality Assurance Program
QC	quality control
QSD	qualified SWPPP developer
QSP	qualified SWPPP practitioner
RAP	reclaimed asphalt pavement
RCSC	Research Council on Structural Connections
RECP	rolled erosion control product
RFI	request for information
RHMA	rubberized hot mix asphalt
RHMA-G	rubberized hot mix asphalt (gap graded)
RHMA-O	rubberized hot mix asphalt (open graded)
RHMA-O-HB	rubberized hot mix asphalt (open graded high binder)
RPL	recycled plastic lumber
RSC	rapid strength concrete
RSP	rock slope protection
RSS	Revised Standard Specifications
RT	radiographic testing
RWQCB	Regional Water Quality Control Board
SMSA	Standard Metropolitan Statistical Area
SC	slow curing
SCC	self-consolidating concrete
SCM	supplementary cementitious material

SDS	Safety data sheet
SSPC	The Society for Protective Coatings
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TEES	Transportation Electrical Equipment Specifications
TIA	time impact analysis
TRO	Time-related overhead
TV	target value
UFFA	ultra fine fly ash
UL	Underwriters Laboratories, Inc
USC	United States Code
USM	unidentified stock material
UT	ultrasonic testing
VECP	value engineering change proposal
VFD	variable-frequency drive
VPM	volts per mil
WMA	Warm mix asphalt
WPC	water pollution control
WPCP	water pollution control program
WPS	welding procedure specification
WQO	Water quality objective

[a]Interpret a reference to AWS as a reference to AWS, ANSI/AWS, or AASHTO/AWS

[b]Interpret a reference to MSDS as a reference to SDS under 29 CFR 1910.1200.

Bid Item List Abbreviations

Abbreviation	Meaning
ACRE	acre
CF	cubic foot
CY	cubic yard
EA	each
(F)	final pay item
GAL	gallon
HR	hour
LB	pound
LF	linear foot
LS	lump sum
LNMI	lane mile
MFBM	thousand foot board measure
MI	mile
MSYD	thousand station yard
STA	station (100 feet)
SF	square foot
SY	square yard
TAB	tablet
TON	2,000 pounds
WDAY	working day

1-1.07 DEFINITIONS

1-1.07A GENERAL

Interpret terms as defined in the Contract Documents.

1-1.07B GLOSSARY

abandon: Render unserviceable in place.

acts of God: "Acts of God" as defined in Public Contract Code § 7105

activity: Task, event, or other project element on a schedule that contributes to completing the project. An activity has a description, start date, finish date, duration, and one or more logic ties.

addenda: Addenda are written or graphic instruments issued by the County prior to opening of Bids, which interpret, clarify, or modify the Contract Documents.

adjust: Raise or lower a facility to match a new grade line.

admitted surety insurer: A surety authorized to transact surety insurance in the State of California, as evidenced by a valid Certificate of Authority issued by the California Department of Insurance in accordance with California Insurance Code section 12070 *et seq.*

aerially deposited lead: Lead primarily from vehicle emissions deposited within unpaved areas or formerly unpaved areas.

Agreement: The executed portion of the Contract Documents, incorporating all the Contract Documents**.**

affiliate: An affiliate of a bidder, Contractor, or Subcontractor is an entity that is subject to control by the same persons who control the bidder, Contractor, or Subcontractor, through joint ownership or otherwise.

applicable law: The term "Applicable Law" means all state, federal, and local laws, statutes, ordinances, codes, rules, and regulations governing the work.

Application for Final Payment: The Contractor's written request for Final Payment including reconciliation of all partial payments, claims, changes or other proper adjustments to the Contract.

archaeological monitoring area: Area within or near construction limits where access is allowed, but work is subject to archaeological monitoring.

archaeological resources: Remains of past human activity, including historic and prehistoric material (e.g., tools and tool fragments, hearth and food remains, structural remains, and human remains).

as-built drawings: The Contractor's daily, current, and complete on-site record set of Drawings showing all changes and details.

authorized laboratory: Independent testing laboratory (1) not employed or compensated by any Subcontractor or Subcontractor's affiliate providing other services for the Contract and (2) authorized by the County.

base: Layer of specified material of planned thickness placed immediately below the pavement or surfacing.

basement material: Material in excavation or embankment under the lowest layer to be placed.

Bid: A complete and properly executed offer by the bidder on County-prescribed forms to perform the work for the prices stated in response to the Notice to Bidders.

bid item: Specific work unit for which the bidder provides a price.

Bid Item List: List of bid items with the associated or estimated quantities in conformity with the Contract Documents.

borrow: Fill acquired from an excavation source outside the described cut area.

1. **local borrow:** Material obtained by widening cuts or excavating from sources outside the planned or authorized cross section on the job site. The location of the local borrow is described or designated by the Engineer.
2. **imported borrow:** Borrow that is not local borrow.

bridge: Structure that:

1. Has a bridge number
2. Carries a utility, railroad, vehicle, pedestrian, or other traffic over, under, or around obstructions or waterways

California Test: Caltrans-developed test for determining work quality. For California Tests, go to the METS website.

Caltrans: California Department of Transportation as defined in Streets & Highway Code § 20 and authorized in Streets & Highway Code § 90; its authorized representatives.

certificate of compliance: Certificate stating the material complies with the Contract that is issued from or by a person or entity acceptable to the County.

Certified Industrial Hygienist: Industrial hygienist certified in comprehensive practice by the American Board of Industrial Hygiene.

Change Order: A written document, using the County's approved standard Change Order form, executed by the Contractor and the County reflecting mutual agreement between the County and Contractor for any of the following:

1. any alteration in, deviation from, addition to, or deletion from the general scope of work of the Contract;
2. a change in the terms or conditions of the Contract; and
3. the amount of the adjustment, if any, in the Contract Price and/or Contract Time.

It constitutes a full settlement and compromise, and an accord and satisfaction. (See section 4-1.05D)

change order work: Work described in a Change Order, including extra work and work described in the Contract as change order work.

Clerk of the Board: Means the Clerk of the governing Board of the Supervisors of the County of San Luis Obispo, State of California.

commercial quality: Quality meeting the best general practices.

commercial source: Established business operating as a material source to the general public.

Construction Change Directive: See section 4-1.05E.

construction permits: Permits required for the proper execution and completion of the work, which are customarily secured after execution of the Contract including, but not limited to, permits related to trenching, excavation, street work, mechanical, electrical, plumbing, and elevators.

Contract: Written and executed contract between the County and the Contractor and includes all Contract Documents.

Contract acceptance: County of San Luis Obispo written acceptance of a completed Contract.

Contract Documents: The Contract Documents are enumerated in the Agreement and consist of the Notice to Bidders, Instructions to Bidders, Bid Forms, General Conditions, Specifications, Appendices, Plans, and all addenda thereto, including permits and other governmental approvals required for the work, other documents listed in the Agreement, and Modifications issued after execution of the Contract.

Contract Price: The Contract Price is the total aggregate amount of the Contractor's bid price based on the estimated quantities listed in the Bid Item List as set forth in the award of the Contract approved by the County, subject to adjustment for variances in quantities and changes pursuant to change orders executed in accordance with the Contract Documents. The Contract Price can only be altered through a Change Order

Contract Time: Number of working days within which the Contractor must fully perform all work under the Contract.

Contractor: Person or business or its legal representative whose Bid is accepted and who enters into a Contract with the County for performance of the work. The Contractor is the prime contractor.

controlling activity: Construction activity that will extend the scheduled completion date if delayed.

County: The County of San Luis Obispo

County Clerk: The Clerk-Recorder of the County of San Luis Obispo, State of California

critical path: Longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path extends the scheduled completion date.

critical path method: Network based planning technique using activity durations and relationships between activities to calculate a schedule for the entire project.

culvert: Structure other than a bridge that provides an opening under a roadway.

data date: Day after the date through which a schedule is current. Everything occurring earlier than the data date is as-built and everything on or after the data date is planned.

day: 24 consecutive hours running from midnight to midnight; calendar day.

1. **business day:** Day on the calendar except a Saturday or a holiday.
2. **working day:** Time measure unit for work progress. A working day is any 24-consecutive-hour period except:
   - 2.1. Saturday and holiday.
   - 2.2. Day during which you cannot perform work on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment due to any of the following:
     - 2.2.1. Adverse weather-related conditions.
     - 2.2.2. Maintaining traffic under the Contract.
     - 2.2.3. Suspension of a controlling activity that you and the Engineer agree benefits both parties.
     - 2.2.4. Unanticipated event not caused by either party such as:
       - 2.2.4.1. Act of God.
       - 2.2.4.2. Act of a public enemy.
       - 2.2.4.3. Epidemic.
       - 2.2.4.4. Fire.
       - 2.2.4.5. Flood.
       - 2.2.4.6. Governor-declared state of emergency.
       - 2.2.4.7. Landslide.
       - 2.2.4.8. Quarantine restriction.
     - 2.2.5. Issue involving a third party, including:
       - 2.2.5.1. Industry or area-wide labor strike.
       - 2.2.5.2. Material shortage.
       - 2.2.5.3. Freight embargo.
       - 2.2.5.4. Jurisdictional requirement of a law enforcement agency.

2.2.5.5. Workforce labor dispute of a utility or nonhighway facility owner resulting in a nonhighway facility rearrangement not described and not solely for the Contractor's convenience. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.

2.3. Day during a concurrent delay.

3. **original working days:** Working days to complete the work shown on the Agreement.

Where working days is specified without the modifier "original" in the context of the number of working days to complete the work, interpret the number as the number of original working days as adjusted by any time adjustment.

deduction: Money permanently taken from progress payment and final payment. Deductions are cumulative and are not retentions under Public Contract Code § 7107.

delay: Event that extends the completion of an activity. See section 8-1.07B

Department: The County of San Luis Obispo acting by and through its Department of Public Works and Transportation except any references to the Department's forms, websites, manuals, guides, test methods in the specifications or plans. These shall be defined as Caltrans forms, websites, manuals, guides, test methods.

detour: Temporary route for traffic around a closed road part. A passageway through a job site is not a detour.

Director: Director of the Department Public Works and Transportation for the County of San Luis Obispo, State of California, acting either directly or through properly authorized agent(s), acting within the scope of the particular duties delegated to them, including registered engineers employed by the Department of Public Works and Transportation

Disadvantaged Business Enterprise: Disadvantaged Business Enterprise as defined in 49 CFR 26.5.

dispose of: Remove from the job site.

divided highway: Highway with separated traveled ways for traffic, generally in opposite directions.

early completion time: Difference in time between an early scheduled completion date and the work completion date.

Engineer: The Resident Engineer responsible for the Contract's administration; the Resident Engineer's authorized representatives.

environmentally sensitive area: Area within or near construction limits where access is prohibited or limited to protect environmental resources.

Extraordinary Measures: Measures implemented by Contractor at County's direction to expedite the progress of design or construction of all or a portion of the work, including, without limitation, (i) working additional shifts or overtime, (ii) supplying additional manpower, equipment, and facilities, and (iii) submitting a recovery schedule for re-sequencing performance of the work or other similar measures.

extra work: Any work, desired or performed, but not included in the original Contract.

FAA: Federal Aviation Administration.

federal-aid contract: Contract that has a federal-aid project number on the cover of the Contract Documents.

Final Completion: Final Completion is the stage of performance of the work when:

1. All work required by the Contract Documents has been fully completed in compliance with the Contract Documents and all Applicable Laws including, but not limited to, correction or completion of all punch list items;
2. Contractor has delivered to the County all closeout documentation required by the Contract Documents including but not limited to the closeout documentation required by section 9-1.17;
3. The work passes the Engineer's final inspection and the Engineer issues a final Certificate for Payment;
4. Final inspection and approval by the County and all applicable governmental agencies has occurred; and
5. The County accepts the work as complete and, in its discretion, and a Notice of Completion and Acceptance is recorded.

final pay item: Bid item whose quantity shown on the Bid Item List is the quantity paid.

finished grade: Final surface of the completed facility. If the work under the Contract includes stage construction, the relation between the finished grade and the work under the Contract is shown.

fixed cost: Labor, material, or equipment cost directly incurred by the Contractor as a result of performing or supplying a particular bid item that remains constant regardless of the item's quantity.

float: Difference between the earliest and latest allowable start or finish times for an activity.

1. **County-owned float:** Time saved on the critical path by actions of the County. It is the last activity shown on the schedule before the scheduled completion date.

force account work: Work ordered on a construction project without an existing agreement on its cost, and performed with the understanding that the contractor will bill the owner according to the cost of labor, materials, and equipment, plus a certain percentage for overhead and profit.

Force Majeure: any of the following events, which materially and adversely affect Contractor's obligations hereunder: earthquakes; acts of god, epidemic, blockade, embargoes, rebellion, war, terrorism, national emergency, riot, act of sabotage, or civil commotion; discovery of any archaeological, paleontological or cultural resources; spill of hazardous substances by a third party at or near the job site which is required to be reported to the California Environmental Protection Agency, Department of Toxic Substances Control; discovery at, near, or on the site of any species listed as "threatened" or "endangered" under the Federal or State Endangered Species Act; or unusually severe weather conditions.

grading plane: Basement material surface on which the lowest layer of subbase, base, pavement, surfacing, or other specified layer is placed.

highway: Whole right-of-way or area reserved for use in constructing the roadway and its appurtenances and other project improvements indicated in the Contractor Documents to be constructed in the right-of-way.

holiday: Holiday shown in the following table:

Holidays

Holiday	Date observed
Every Sunday	Every Sunday
New Year's Day	January 1st
Birthday of Martin Luther King, Jr.	3rd Monday in January
Lincoln's Birthday	February 12th
Washington's Birthday	3rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Native American Day	4th Friday in September
Veterans Day	November 11th
Thanksgiving Day	4th Thursday in November
Day after Thanksgiving Day	Day after Thanksgiving Day
Christmas Day	December 25th

If January 1st, February 12th, March 31st, July 4th, November 11th, or December 25th falls on a Sunday, the Monday following is a holiday. If November 11th falls on a Saturday, the preceding Friday is a holiday.

Hours of darkness: Hours of darkness as defined in Vehicle Code section 280.

idle equipment: Equipment:

1. On the job site at the start of a delay
2. Idled because of the delay
3. Not operated during the delay

job site: Area within the defined boundaries of a project.

***Labor Surcharge and Equipment Rental Rates*:** Caltrans publication that lists labor surcharge and equipment rental rates.

landscaping: Practice of a landscaping contractor under 16 California Code of Regulations § 832.27.

material: Any product or substance specified for use in the construction of a project.

material shortage:

1. Shortage of raw or produced material that is area-wide and caused by an unusual market condition except if any of the following occurs:
   1.1 Shortage relates to a produced, nonstandard material
   1.2 Supplier's and the Contractor's priority for filling an order differs
   1.3 Event outside the U.S. for a material produced outside the U.S.
2. Unavailability of water that delays a controlling activity

material source facility audit: Self-audit and a County or Caltrans audit evaluating a facility's capability to consistently produce materials that comply with the specifications.

median: Portion of a divided highway separating the traveled ways including inside shoulders.

milestone: A deadline for completion of a portion of the work established in the Contract Documents. Event activity that has zero duration and is typically used to represent the start or end of a certain stage of the project.

mobilization: Preparatory work that must be performed or costs incurred before starting work on the various items on the job site (Public Contract Code § 10104).

modify Add to or subtract from an appurtenant part.

Modification: (1) a Change Order, (2) a Construction Change Directive or (3) a written order for a minor change or clarification of the work issued by the Engineer.

narrative report: Document submitted with each schedule that discusses topics related to project progress and scheduling.

near critical path: Chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.

Notice to Proceed: A written document issued by the County establishing the date of commencement of the Contract Time. The Contract Time for Contractor's performance of the work is measured in working days from the date of commencement established in the Notice to Proceed.

obliterate Place an earth cover over or root, plow, pulverize, or scarify.

or equal substitution: The material product, equipment, or process proposed by the Contractor for use in the work as equivalent to that specified in the Contract Documents. See section 4-1.07.

pavement: Uppermost layer of material placed on the traveled way or shoulder.

Permanent erosion control establishment period: Number of working days shown on the Notice to Bidders for permanent erosion control establishment work.

plans: Standard Plans, Revised Standard Plans, and Project Plans.

1. **Standard Plans:** The version of the Standard Plans of the State of California, Department of Transportation (Caltrans) and the County's Standard Construction Drawings referenced in the Technical Provisions section of the Contract Documents
2. **Revised Standard Plans:** New or revised standard plans referenced in the Technical Provisions of the Contract Documents.
3. **Project Plans:** Drawings specific to the project.

plant establishment period: Number of working days shown on the Notice to Bidders for plant establishment work.

quality characteristic: Characteristic of a material that is measured to determine conformance with a given requirement.

quality control plan: Contractor's plan to ensure QC.

reconstruct: Remove and disassemble and construct again at an existing or new location.

relocate: Remove and install or place in a new location.

remove: Remove and dispose of.

reset: Remove and install or place laterally at the same station location.

roadbed: Roadway portion extending from curb line to curb line or shoulder line to shoulder line. A divided highway has 2 roadbeds.

roadside: Area between the outside shoulder edge and the right-of-way limits.

roadway: That portion of the highway within the outside lines of curbs, sidewalks, slopes, ditches, channels, or waterways. Roadway includes structures and features necessary for safety, protection of facilities, and drainage.

salvage: Remove, clean, and haul to a specified location.

schedule:

1. **baseline schedule:** Initial schedule showing the original work plan starting on the date of Contract approval. This schedule shows no completed work to date and no negative float or negative lag to any activity.
2. **revised schedule:** Schedule that incorporates a proposed or past change to logic or activity durations.
3. **updated schedule:** Current schedule developed from the accepted baseline and any subsequent accepted updated or revised schedules through regular monthly review to incorporate actual past progress.

scheduled completion date: Planned work completion date shown on the current schedule.

shoulder: Roadway portion contiguous with the traveled way for accommodation of a stopped vehicle, emergency use, and lateral support of base and surface courses.

small tool: Tool or piece of equipment not listed in Labor Surcharge and Equipment Rental Rates that has a replacement value of $500 or less.

specifications: Standard Specifications, Revised Standard Specifications, and Special Provisions.

1. **Standard Specifications:** The version of the Standard Specifications of the State of California, Department of Transportation (Caltrans) referenced in the Technical Provisions section of the Contract Documents. These specifications are in a book titled *Standard Specifications*.
2. **Revised Standard Specifications:** New or revised standard specifications. These specifications are included in the Appendices to the *Contract Documents*.
3. **Special Provisions:** Specifications specific to the project. These specifications are in a section titled *Special Provisions* of the *Contract Documents*.

State: The State of California, including its agencies, departments or divisions whose conduct or action is related to the work.

Structure Design: Offices of Structure Design of the Department of Transportation.

subbase: Layer of material between a base and the basement material.

Subcontract: Contract between the Contractor and Subcontractor to perform a portion of the work.

Subcontractor: A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor.

Sub-subcontractor: A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

subgrade: Roadbed portion on which pavement, surfacing, base, subbase, or a layer of any other material is placed.

submittal:

1. **action submittal:** Written and graphic information and samples that require the County's response.
2. **informational submittal:** Written information that does not require the County's response.

substantial defects: Defects plainly seen as damaged, displaced, or missing parts or improper functioning of materials, parts, equipment, or systems.

substructure: Bridge parts below the bridge seats, pier tops, and haunches for rigid-framed bridges or spring lines for arched bridges; includes abutment backwalls, abutment parapets, and wingwalls.

superstructure: Bridge parts except the substructure.

supplemental project information: Information relevant to the project, specified as supplemental project information, and made available to bidders.

surfacing: Uppermost layer of material placed on a traveled way or shoulders; pavement.

time impact analysis: Analysis using a CPM schedule developed specifically to demonstrate the effect a proposed or past change or delay has on the current scheduled completion date.

time-scaled network diagram: Graphic depiction of a CPM schedule comprised of activity bars with relationships for each activity represented by arrows. The tail of each arrow connects to the activity bar for the predecessor and points to the successor.

total float: Amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.

traffic: Pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel.

traffic break: Traffic operation performed by a California Highway Patrol officer or other law enforcement officer to slow or stop traffic within the traveled way.

traffic lane: Portion of traveled way used for the movement of a single line of vehicles.

traveled way: Roadway portion for the movement of vehicles except shoulders, berms, sidewalks, and parking lanes.

tunnel: Tunnel as defined in 8 California Code of Regulations § 8405 et seq.

unauthorized work: Work performed that is not required or authorized by the Contract.

Unit Price: Bid Item price entered by bidder or a "Contract Item" price established by County in the Bid as a price per unit of measurement for payment for materials, equipment or services including supervision, overhead and profit for a portion of the work described in the Contract Documents

unsuitable material: Material encountered below the natural ground surface in embankment areas or below the grading plane in excavation areas that the Engineer determines to be in any of the following conditions:

1. Of such unstable nature that it cannot be compacted to the specified density using ordinary methods at optimum moisture content.
2. Too wet to be properly compacted and cannot be dried before incorporating it into the work. Excessive moisture alone is not sufficient cause for determining that the material is unsuitable.
3. Inappropriate for the planned use.

withhold: Money temporarily or permanently taken from progress payment.

work: The resources, activities, construction and other services specified, indicated, shown, or reasonably inferable from the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations, including, but not limited to all alterations, amendments, extensions to it made by Change Order or Construction Change Directive required for Contract acceptance by the County.

work directive: a unilateral written order issued by the County directing the Contractor to continue performance of the work or a disputed item of work pending resolution of a Claim or dispute concerning the scope of work or issued after a Contractor default. The County will use a work directive when it does not agree with the Contractor's request for a change.

work plan: Detailed formulation of a program of action.

work zone: Area of a highway with construction, maintenance, or utility work activities.

1-1.08-1-1.09 RESERVED

1-1.10 PAVEMENT CLIMATE REGIONS

To help account for the effects of various climatic conditions on pavement performance, the State has been divided into 9 climate regions. The project's pavement climate region is shown on the Project Plans.

1-1.11 WEBSITES, ADDRESSES, AND TELEPHONE NUMBERS

Websites, Addresses, and Telephone Numbers

Reference or agency or department unit	Website	Address	Telephone no.
Authorized Material Lists Authorized Material Source Lists	https://dot.ca.gov/programs/engineering-services/authorized-laboratory-list	--	--
Caltrans	http://www.dot.ca.gov	--	--
County of San Luis Obispo Public Works Department	http://www.slocounty.ca.gov/PW.htm	976 OSOS STREET SAN LUIS OBISPO, CA 93408	(805)781-5252
Data Interchange for Materials Engineering	https://dime.dot.ca.gov/	MATERIALS ENGINEERING AND TESTING SERVICES 5900 FOLSOM BLVD SACRAMENTO, CA 95819-4612	--
Department of Industrial Relations	http://www.dir.ca.gov	455 GOLDEN GATE AVENUE SAN FRANCISCO, CA 94102	--
Caltrans Division of Construction	http://www.dot.ca.gov/hq/construc/	--	--
METS	http://www.dot.ca.gov/hq/esc/Translab/	--	(916) 227-7000
Offices of Structure Design, Documents Unit	--	MSC 9-4/4I DOCUMENTS UNIT OFFICES OF STRUCTURE DESIGN 1801 30TH ST SACRAMENTO, CA 95816-7006	(916) 227-0716
SWRCB, Land Disposal Program	https://www.waterboards.ca.gov/water_issues/programs/land_disposal/	--	--

1-1.12 MISCELLANY

Make checks and bonds payable to the County of San Luis Obispo.

1-1.13 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if: (a) delivered in person to the individual or member of the firm or entity for whom it was intended; (b) sent by certified mail, return receipt requested; (c) sent by a recognized overnight mail or courier service; or (d) sent by facsimile or e-mail followed by a hard copy and with receipt confirmed by telephone, to the addresses set forth in the Agreement (or to such other address as may be specified in writing by such person or entity). Notice shall be deemed effective: (a) upon delivery, if personally delivered; (b) upon telephone confirmation, if sent by facsimile or e-mail; (c) upon 1 business day following

deposit with a recognized overnight mail or courier service; or (d) upon 2 business days following deposit in the United States mail, postage prepaid, return receipt requested.

1-1.14 INDEPENDENT CONTRACTOR

Contractor is employed hereunder to render a service within the scope of its training and experience, and Contractor shall be an independent contractor and not an employee of the County. As such, the County shall not be called upon to assume any liability for the direct payment of any salary to any employee or Subcontractor of Contractor, nor to pay any benefit to any employee or Subcontractor or vendor under the Workers' Compensation laws. None of Contractor's officers, agents, employees, and Subcontractors, nor any of their agents, officers, and employees, shall be deemed officers, agents, employees and Subcontractors of the Owner, and the County shall not be liable or responsible to them for anything whatsoever other than liability to Contractor set forth in this Contract.

2 RESERVED

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3 CONTRACT AWARD AND EXECUTION

3-1.01 GENERAL

Section 3 includes specifications related to contract award and execution.

3-1.02 CONSIDERATION OF BIDS

3-1.02A GENERAL

For a lump sum based bid, the County compares bids based on the total price.

For a unit price based bid, the County compares bids based on the sum of the item totals.

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, except as provided:

1. if the amount set forth as a unit price is ambiguous, unintelligible, or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.
2. (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage-wise the unit price or item total in the County's final estimate of cost.

3-1.02B TIED BIDS

The County breaks a tied bid with a coin toss.

3-1.03 CONTRACTOR REGISTRATION

No Contractor or Subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

3-1.04 RESERVED

3-1.05 CONTRACT BONDS

The successful bidder must furnish 2 bonds:

1. Payment bond meeting all the statutory requirements of the State of California on a form provided by the County in an amount that shall remain equal to at least one hundred percent (100%) of the Contract Price to secure payment of all claims, demands, stop payment notices, or charges of the State of California, of material suppliers, mechanics, or laborers employed by the Contractor or by any Subcontractor or any person, firm or entity eligible to file a stop payment notice with respect to the work.
2. Performance bond meeting all statutory requirements of the State of California on the form provided by the County. The bond shall be furnished as a guarantee of the faithful performance of the requirements of the Contract Documents as may be amended from time to time including, but not limited to, liability for delays and damages (both direct and consequential) to the County and the County's separate contractors and consultants, warranties, guarantees and indemnity obligations, in an amount that shall remain equal to at least one hundred percent (100%) of the Contract Price.

All bonds shall be executed by a California admitted surety insurer. Bonds issued by a California admitted surety listed in the latest versions of the U.S. Department of Treasury Circular 570 shall be deemed to be accepted unless specifically rejected by the County. Bonds from a California admitted surety not listed in Treasury Circular 570 must be accompanied by all of the documents enumerated in Code of Civil Procedure section 995.660(a). The attorney-in-fact who executes the required bonds on behalf of the surety shall affix thereto a certified and current copy of the power of attorney. In the event of changes which increased the Contract Price, the amount of each bond shall be deemed to increase and at all times remain equal to the Contract Price. The signatures shall be acknowledged by a Notary Public.

Every bond must display the surety's bond number and incorporate the Contract for construction of the work by reference. The terms of the bonds shall provide that the surety agrees that no change, extension of time, alteration or modification of the Contract Documents or the work to be performed thereunder shall in anyway affect its obligations and shall waive notice of any such change, extension of time, or alteration or modification of the Contract Documents.

Surety further agrees that it is obligated under the bonds to any successor, grantee, or assignee of the County.

Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

Should any bond become insufficient, or should any of the sureties, in the opinion of the County, become non-responsible or unacceptable, the Contractor shall within 10 days after receiving notice from the County provide written documentation to the satisfaction of the County that Contractor has secured new or additional sureties for the bonds, otherwise the Contractor shall be in default of the Contract. No further payments shall be deemed due or will be made under the Contract until a new surety(ies) qualifies and is accepted by the County.

3-1.06 CONTRACTOR LICENSE

The Contractor must be properly licensed as a contractor from contract award through Contract acceptance (Public Contract Code § 20103.5).

3-1.07 INSURANCE POLICIES

The successful bidder must submit:

1. Copy of its commercial general liability policy and its excess policy or binder until such time as a policy is available, including the declarations page, applicable endorsements, riders, and other modifications in effect at the time of contract execution. Standard ISO form no. CG 0001 or similar exclusions are allowed if not inconsistent with section 7-1.06. Allowance of additional exclusions is at the discretion of the County.
2. Certificate of insurance showing all other required coverages. Certificates of insurance, as evidence of required insurance for the auto liability and any other required policy, shall set forth deductible amounts applicable to each policy and all exclusions that are added by endorsement to each policy. The evidence of insurance shall provide that no cancellation, lapse, or reduction of coverage will occur without 10 days prior written notice to the County.
3. A declaration under the penalty of perjury by a CPA certifying the accountant has applied GAAP guidelines confirming the successful bidder has sufficient funds and resources to cover any self-insured retentions if the self-insured retention is over $50,000.

If the successful bidder uses any form of self-insurance for workers compensation in lieu of an insurance policy, it shall submit a certificate of consent to self-insure under Labor Code § 3700.

3-1.08-3.17 RESERVED

3-1.18 CONTRACT EXECUTION

The successful bidder must deliver to the County:

1. Signed Agreement
2. Payment and performance bonds in accordance with section 3-1.05
3. Insurance documentation in accordance with section 7-1.06
4. W-9 form

The County must receive these documents before the 5th business day after the bidder receives the contract for execution.

The contract is not considered executed by the successful bidder unless all of the above documents are received by the County within the specified time frame.

In addition to potential bid bond forfeiture and other remedies available to the County, the Contractor's failure to return all of the above documents within 10 business days after the Contractor has received the contract for execution, shall result in the deduction of 1 working day from the Contract Time for every day of delay in the County's receipt of said documents, if, in the Director's sole discretion, it is determined that the issuance of the Notice to Proceed has been delayed.

By executing the Agreement, Contractor represents: (1) that it has visited the job site, familiarized itself with the local conditions under which the work is to be performed including, without limitation, the conditions contained in any test results and/or reports provided to the Contractor, and the conditions reflected on any site surveys provided to the Contractor; (2) that it is fully experienced, qualified and competent to perform the services set forth in the Contract Documents; (3) that it is properly equipped, organized and financed to perform the work; (4) that it is properly permitted and licensed by the State of California and all other governmental entities to perform the work required by the Contract and that it will retain only properly licensed Subcontractors to perform the work of the Contract; (5) that it has familiarized itself with all conditions bearing upon transportation, disposal, handling and storage of materials; (6) that it has familiarized itself with the availability of labor, water, electric power, and roads; (7) that it has familiarized itself with uncertainties of weather, or similar physical conditions at the job site; (8) that it has familiarized itself with the character of equipment and facilities needed preliminary to and during performance of the work; (9) that it has familiarized itself with the staging and material storage constraints of the job site and surrounding buildings and will confine its staging and storage operations to approved areas; (10) that it shall maintain the immediate surrounding areas in a clean and safe manner at all times; (11) that it will coordinate its construction activities with other contractors performing work on the job site; and (12) that it will adhere to and be bound by any conditions imposed by the commissions of the County and any regulatory agency or governmental entity with jurisdiction over the Project.

In addition, and without limiting the foregoing warranties, Contractor represents and warrants to the County as follows:

2. Contractor has familiarized itself with the nature and extent of the Contract Documents, the work, the job site, the as-built conditions of the job site, locality, and all laws, rules,

ordinances, and regulations of all government authorities having jurisdiction, that in any manner may affect costs, progress, performance or furnishing of the work.

3. Contractor has correlated the results of all observations, examinations, investigations, explorations, tests, reports, and studies referred to in this section with the terms and conditions of the Contract Documents.
4. Contractor has given the County written notice of all conflicts, errors, or discrepancies (if any) that it has discovered in the Contract Documents. Contractor acknowledges that the County has made a written resolution of all such conflicts, errors, or discrepancies prior to execution of this Agreement and agrees that such written resolution is acceptable to Contractor.
5. Contractor is experienced and competent in the interpretation and use of specifications and design drawings, and in the use of materials, equipment, and construction techniques as are required to successfully complete the Project. Contractor shall, at its own expense, employ any and all experts necessary to successfully complete the construction work required by the Contract Documents.

The County assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the County. Nor does the County assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its representatives or agents before the execution of this Contract, unless that understanding or representation is expressly stated in the Contract Documents.

Submit the following documents to the County within 10 business days of receipt of the fully executed contract:

1. Storm Water Pollution Prevention Plan or Water Pollution Prevention Plan (whichever applies) – 2 copies
2. Recycling Plan
3. CPM baseline schedule
4. Identity of Safety Officer

3-1.19 BIDDERS' SECURITIES

The County keeps the securities of the 1st, 2nd, and 3rd low bidders until the contract has been executed. The other bidders' securities, other than bidders' bonds, are returned upon determination of the 1st, 2nd, and 3rd low bidders, and their bidders' bonds are of no further effect.

4 SCOPE OF WORK

4-1.01 GENERAL

Attention is directed to Section 40 “Scope of Work” of the FAA General Contract Provisions. Section 4 includes specifications related to the scope of work.

4-1.02 INTENT

4-1.02A GENERAL

The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. All work mentioned or indicated in the Contract Documents, and all work reasonably inferable from them, shall be performed by the Contractor as part of the Contract unless it is specifically indicated in the Contract Documents that such work is to be done by others.

Nothing in the specifications voids the Contractor's public safety responsibilities.

In the event of conflict between any of the Contract Documents, the provision placing a more stringent requirement on the Contractor shall prevail. The Contractor shall provide the better quality or greater quantity of work and/or materials unless otherwise directed by the County in writing. In the event none of the Contract Documents place a more stringent requirement or greater burden on the Contractor, the controlling provision shall be that which is found in the document with higher precedence (see section 5-1.02). Unless a more stringent requirement is provided in the Contract Documents, the Contractor shall provide for work completion using the best general practices. Nothing herein shall relieve the Contractor of its obligation to notify the County of any inconsistencies in the documents.

4-1.02B FIELD MEASUREMENTS

Since the Contract Documents are complementary, the Contractor shall, before starting each portion of the work, carefully study and compare the various plans and other Contract Documents relative to that portion of the work, as well as the information furnished by the County (surveys, construction staking, and supplemental project information, if any), and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Engineer any errors, inconsistencies or omissions discovered by or made known to the Contractor as a Request for Information (“RFI”) submitted to the Engineer, in such form as the Engineer may require. The accuracy of grades, elevations, dimensions, or locations of existing conditions are not guaranteed by the County, and the Contractor is responsible for verifying same, except to the extent that the County performs the construction staking for the Project.

4-1.03 WORK DESCRIPTION

Construct the work described in the Contract Documents.

4-1.04 USE OF MATERIALS FOUND ON THE JOB SITE

You may use aggregate or other materials found in excavation that comply with the specifications with approval by the Engineer. You are not entitled to any additional compensation for using such materials found on the job site since the County pays for the material excavated at the

excavation item Unit Price. Replace the quantity of material removed and used with an equal quantity of material. The material must have been designated for use in the work. Except for material used as structure backfill, the County does not pay for replacing the material. The County pays for excavated material replacement used for structure backfill at the Unit Price for structure backfill. Do not excavate material from outside the excavation's slope and grade lines without authorization.

4-1.05 CHANGES AND EXTRA WORK

4-1.05A GENERAL

Attention is directed to Section 40-04 of the FAA General Contract Provisions. Changes in the work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order or Construction Change Directive, subject to the limitations stated in this section and elsewhere in the Contract Documents. The County may, at any time, without notice to Contractor's surety(ies), order changes in the work within the general scope of the Contract.

Changes in the work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order or Construction Change Directive.

4-1.05B WORK-CHARACTER CHANGES

The County adjusts the unit price for an item if:

1. An ordered plan or specification change materially changes the character of a work item from that on which the bid price was based
2. The unit cost of the changed item differs when compared to the unit cost of that item under the original plans and specifications
3. No approved Change Order addresses the payment

The County adjusts the payment under section 9-1.15, "Work-Character Changes."

4-1.05C CHANGE ORDERS

A Change Order is a written document, using the County's approved standard Change Order form, executed by the Contractor and the County reflecting mutual agreement between the County and Contractor for any of the following:

1. any alteration in, deviation from, addition to, or deletion from the general scope of work of the Contract;
2. a change in the terms or conditions of the Contract; and
3. the amount of the adjustment, if any, in the Contract Price and/or Contract Time.

4-1.05D ACCORD AND SATISFACTION

Contractor's agreement on any Change Order shall be a full compromise and settlement of all adjustments to the Contract Time and Contract Price, and all compensation for any and all delay, extended or additional field and home office overhead, disruption, acceleration, inefficiencies, lost labor or equipment productivity, differing site conditions, construction interferences and other extraordinary or consequential damages (hereinafter called "Impacts"), including any ripple or cumulative effect of said Impacts on the overall work under the Contract arising directly or indirectly from the performance of work described in the Change Order. By execution of any Change Order, Contractor agrees that the Change Order constitutes a complete accord and satisfaction with respect to all claims for schedule extension, Impacts, or any costs of whatsoever

nature, character or kind arising out of or incidental to the Change Order. No action, conduct, omission, product failure or course of dealing by the County shall act to waive, modify, change, or alter the requirement that Change Orders must be in writing, signed by the County and Contractor and that such written Change Orders are the exclusive method for effectuating any change to the Contract Price and/or Contract Time.

4-1.05E CONSTRUCTION CHANGE DIRECTIVES

A unilateral written order prepared and signed by the Engineer directing the Contractor to perform a change in the work. The Engineer may by Construction Change Directive, without invalidating the Contract, order changes in the work, including additions, deletions, revisions, extra work. A Construction Change Directive may or may not warrant a change in Contract Time or Contract Price.

4-1.05F ADJUSTMENT OF CONTRACT PRICE

If the Construction Change Directive or Bilateral Change Order provides for an adjustment to the Contract Price, the adjustment shall be based on one or a combination of the following methods:

1. Bid item prices
2. Agreed price
3. Force account
4. Specialist billing

If the Engineer chooses to pay for Change Order Work based on an agreed price, but the Contractor and the Engineer cannot agree on the price, the County pays by force account.

If a portion of extra work is covered by bid items, the County pays for this work as changed quantities in those items. The County pays for the remaining portion of the extra work by force account or agreed price under section 9-1.06.

4-1.05G AUTHORITY TO APPROVE CHANGES

The Engineer has sole authority to approve changes that affect the Contract Price, Contract Time, or design of the Project, subject to limitations set forth in Public Contract Code section 20142. Except as specified in this section, the Engineer shall have exclusive authority over the monetary and budgetary matters concerning the Contract.

4-1.05H NO VERBAL CHANGES

All changes to the Contract, whether resulting in an increase, decrease, or no change in the Contract Price or Contract Time, must be in a written document that is authorized by the Contract Documents and signed by an authorized representative of the County.

4-1.05I RESERVED

4-1.05J COUNTY-INITIATED CHANGE PROPOSAL REQUEST

The County may issue a Change Proposal Request, in writing, to the Contractor, describing a proposed change to the work and requesting the Contractor submit an itemized proposal in a format acceptable to the County within 10 days after the County's issuance of the Change Proposal Request. The Contractor's proposal shall include an analysis of impacts to cost and time, if any, to perform the extra work, or to delete work, as applicable, including the effects and impacts, if any, on unchanged work, estimates of costs, and Contractor's proposed methods to minimize costs, delay and disruption to the performance of the work. If Contractor fails to submit

a written proposal within such period of time, the change described in the County's Change Proposal Request shall be deemed to not result in an increase to the Contract Price or Contract Time and the change shall be performed by Contractor without any such increases. A Change Proposal Request does not authorize the Contractor to commence performance of the changed work. Contractor shall not perform any change until receipt of the County's written approval through either a Change Order or Construction Change Directive.

4-1.05K RESERVED

4-1.05L CREDIT FOR DELETED WORK

Contractor agrees that the County has the right, in its sole discretion, to determine whether any or all the work described in the Contract Documents shall be deleted or whether to terminate Contractor's performance, in whole or in part, under the Contract Documents and without any penalty being incurred by the County.

When an entire Bid Item or portion of Bid Item is deleted from the Contract, the value for such deleted work established in the Bid Item List shall be used to calculate the credit amount, less the value of any work of such item performed.

4-1.05M FINAL DETERMINATION OF ADJUSTMENT OF CONTRACT SUM AND CONTRACT TIME

After issuance of a Construction Change Directive, when the County and Contractor reach agreement on adjustment of the Contract Price and Contract Time, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

4-1.06 DIFFERING SITE CONDITIONS

4-1.06A GENERAL

23 CFR 635.109 is made a part of this contract and incorporated herein by reference.

4-1.06B CONTRACTOR'S NOTIFICATION

Under Public Contract Code section 7104, during the progress of the work, promptly notify the Engineer in writing if you encounter any of the following:

1. Material you believe may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
2. Subsurface or latent physical conditions at the job site differing from those indicated in the Contract.
3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

Upon receipt of your written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ, or do involve hazardous waste, and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, as determined in accordance with section 4-1.05. The Engineer will notify the Contractor of the determination whether or not an adjustment of the Contract is warranted. No Contract adjustment which results in a benefit to you will be allowed unless you have provided the required written notice.

No Contract adjustment will be allowed under this section for any effects caused on unchanged work.

4-1.06C SUSPENSIONS OF WORK ORDERED BY THE ENGINEER

If the performance of all or any portion of the work is suspended or delayed by the Engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and you believe that additional compensation and/or Contract Time is due as a result of such suspension or delay, submit to the Engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

Upon receipt, the Engineer will evaluate your request. If the Engineer agrees that the cost and/or time required for the performance of the Contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or Subcontractors at any approved tier, and not caused by weather, the Engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. You will be notified of the Engineer's determination whether or not an adjustment of the contract is warranted.

No Contract adjustment will be allowed unless you have submitted the request for adjustment within the time prescribed.

No Contract adjustment will be allowed under this section to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided or excluded under any other term or condition of this Contract.

4-1.06D SIGNIFICANT CHANGES IN THE CHARACTER OF WORK

Attention is directed to Section 40-02 of the FAA General Contract Provisions. The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.

If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.

The term “significant change” shall be construed to apply only to the following circumstances:

- When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or
- When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original

contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

4-1.07 VALUE ENGINEERING

4-1.07A GENERAL

Reserved.

4-1.07B VALUE ENGINEERING CHANGE PROPOSAL

Reserved.

4-1.07C VALUE ANALYSIS WORKSHOP

Not Used.

4-1.08–4-1.12 RESERVED

4-1.13 CLEANUP

Before final inspection, leave the job site neat and presentable and dispose of:

1. Rubbish
2. Excess materials
3. Falsework
4. Temporary structures
5. Equipment

The County does not require you to remove warning, regulatory, or guide signs before Contract acceptance.

5 CONTROL OF WORK

5-1.01 GENERAL

Section 5 includes specifications regarding the Contract parties' relations and Contract acceptance.

Furnish the resources except County-furnished materials required to complete the work as described in the Contract.

Provide QC.

Work is subject to the County's QAP. The County's QA does not relieve you of your responsibility to provide QC.

Ensure the County's safe and unrestricted access to the work. Furnish facilities necessary for the County's inspection.

Where the means and methods to complete the work are not described in the Contract, choose the means and methods to complete the work.

The Contractor shall be responsible for all aspects of the work, including the supervision and direction of the work, and shall use its best skill and attention at all times. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the work under the Contract, unless the Contract Documents give other specific instruction concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the job site safety thereof and, shall be fully and solely responsible for the job site safety of such means, methods, techniques, sequences, or procedures. If the Contractor has reason to believe that such means, methods, techniques, sequences, or procedures may not be safe, reasonable, or effective, the Contractor shall give timely written notice to the County and shall not proceed with that portion of the work without further written instructions from the Engineer. Where the Contract describes more than 1 construction method or more than 1 type of material or equipment, the County does not assure that each construction method or type of material or equipment can be used successfully throughout all or any part of the project. You are responsible to use the alternative or alternatives that will accomplish the work under the conditions encountered.

Failure to comply with any Contract part is a waiver of your right to an adjustment of time and payment related to that part.

Use contract administration forms at the Caltrans website unless otherwise specified or requested by the Engineer.

5-1.02 CONTRACT COMPONENTS

In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following order of precedence:

1. Permits and other government approvals
2. Change Orders and Construction Change Directives, issued after execution of the Agreement
3. Agreement
4. Project-Specific Requirements for Airport Construction
5. FAA Technical Specifications
6. FAA General Construction Items

7. Required Federal Provisions
8. Special Provisions
9. Project Plans
10. FAA General Contract Provisions
11. County General Conditions
12. Cited FAA Advisory Circulars
13. Cited Standards for Materials and Testing
14. Bidding Documents
15. Supplemental Project Information

In the event of conflicts or discrepancies within the Contract Documents, interpretations will be based on the following order of precedence:

1. Written numbers and notes on a drawing govern over graphics
2. A detail drawing governs over a general drawing
3. A detail specification governs over a general specification
4. A specification in a section governs over a specification referenced by that section

If a discrepancy is found or confusion arises, submit an RFI.

5-1.03 ENGINEER'S AUTHORITY

The Engineer makes the final decision on questions regarding the Contract, including:

1. Work quality and acceptability
2. Manner of performance of the work
3. Contract interpretation, including drawing and specification interpretation
4. Contract fulfillment
5. Time and progress rate
6. Measurement and payment

The Engineer has the authority to enforce or fulfill an order that you fail to fulfill promptly.

Failure to enforce a Contract part does not waive enforcement of any Contract provision.

The Engineer may reject work that does not comply with the Contract at any time, including after a payment has been made.

5-1.04 COUNTY'S RIGHT TO STOP THE WORK AND CARRY OUT THE WORK

5-1.04A COUNTY'S RIGHT TO STOP THE WORK

If the Contractor fails to correct work that is not in accordance with the requirements of the Contract Documents as required by section 5-1.30 or repeatedly fails to carry out work in accordance with the Contract Documents, the County may issue a written order to the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the County to stop the work shall not give rise to a duty on the part of the County to exercise this right for the benefit of the Contractor or any other person or entity. The County's right to stop the work is in addition to and without prejudice to any other rights or remedies of the County.

5-1.04B COUNTY'S RIGHT TO CARRY OUT THE WORK

Notwithstanding other remedies available to the County, if the Contractor defaults or neglects to carry out the work in accordance with the Contract Documents and fails within a **forty-eight (48)**

hour period after receipt of written notice from the County to commence and continue correction of such default or neglect with diligence and promptness, the County, at its sole option and without obligation, may, with its own or outside forces, correct such deficiencies. In such case, an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including compensation for the County and its consultants' additional services and expenses made necessary by such default, neglect, or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the County, immediately. This remedy is cumulative. The County may terminate the Contractor's performance pursuant to the terms of the Contract. The County also has the right, but not the obligation, to self-perform or have other companies perform portions of the work previously assigned to Contractor. In such case an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the cost of performing such work efforts.

5-1.05 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in section 5-1.43.

5-1.06 PROTESTS

You may protest an Engineer's decision by submitting an RFI.

5-1.07–5-1.11 RESERVED

5-1.12 ASSIGNMENT

The County and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents.

The Contractor shall not sublet or assign the Contract or any portion thereof or any monies due thereunder, without the express prior written consent and approval of the County, which approval may be withheld in the sole discretion of the County. The County's approval to such assignment shall be upon such terms and conditions as determined by the County in its sole and exclusive discretion.

The County may assign the Contract with Contractor's prior written consent, which shall not be unreasonably withheld. In the event the Contractor is so assigned by the County, Contactor agrees, upon the assignee's request, to continue and complete performance of the work upon payment of any undisputed outstanding amounts due Contractor under the terms of the Contract. Any entity which shall succeed to the rights of the County shall be entitled to enforce the rights of the County hereunder. If requested by such entity, Contractor will execute a separate letter or other agreement with such entity further evidencing Contractor's commitment to continue performance of the Contract.

5-1.13 SUBCONTRACTING

5-1.13A GENERAL

No subcontract releases you from the Contract or relieves you of your responsibility for a Subcontractor's work. The Contractor shall be responsible to the County for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the work for, or on behalf of, the Contractor or any of its Subcontractors and for any damages, losses, costs and expenses resulting from such acts or omissions.

Before subcontracted work starts, submit a *Subcontracting Request* form available on the following Caltrans website:

http://www.dot.ca.gov/hq/construc/forms.htm

Do not use a debarred contractor. For a list of debarred contractors, go to the Department of Industrial Relations' website (California) at www.dir.ca.gov/dlse/debar.html and the System for Award Management (federal) at www.sam.gov.

If you violate Public Contract Code § 4100 et seq., the County may exercise the remedies provided under Public Contract Code § 4110. The County may refer the violation to the Contractors State License Board as provided under Public Contract Code § 4111.

Perform work equaling at least 30 percent of the value of the original total bid with your employees and with equipment you own or rent, with or without operators.

Each subcontract must comply with the Contract.

Each Subcontractor must have an active and valid:

1. State contractor's license with a classification appropriate for the work to be performed (Business and Professions Code § 7000 et seq.).
2. Public work contractor registration number with the Department of Industrial Relations

Submit copies of subcontracts upon request.

Upon County's request, Contractor shall immediately remove and not again use a Subcontractor who fails to prosecute the work satisfactorily. The Contractor shall not contract with any Subcontractor or supplier that is uninsured or not properly licensed. The Contractor shall not contract with, or allow its Subcontractors or suppliers to contract with, a proposed person or entity to whom the County has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

The County's consent to or approval of any Subcontractor under this Contract shall not in any way relieve the Contractor of his obligations under this Contract and no such consent or approval shall be deemed to waive any provision of this Contract.

5-1.13A(1) Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including responsibility for safety of the Subcontractor's work, which the Contractor, by these Contract Documents, assumes toward the County. Each subcontract agreement shall preserve and protect the rights of the County under the Contract Documents

with respect to the work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the County. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound by this section 5-1.13, and identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents, and shall require that the Subcontractor modify the Subcontractor agreement so that it is consistent with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5-1.13A(2) Subcontract Provisions

Each subcontract or supply agreement shall contain provisions that:

1. Require that the work being performed pursuant to such subcontract or supply agreement, as the case may be, be performed in accordance with the requirements and intent of the Contract Documents;
2. Require Subcontractor, Sub-subcontractor, and supplier to furnish to Contractor or the applicable Subcontractor, as the case may be, in a timely fashion all information necessary for the preparation and submission of the reports, operations and maintenance manuals, warranties, as-built information, and closeout documents required herein;
3. Require that each Subcontractor and supplier continue to perform under its subcontract or supply agreement if the Contract is terminated and if the County takes an assignment of the subcontract or supply agreement and requests the Subcontractor or supplier to continue such performance; and
4. Include the termination and suspension provisions set forth in section 8-1.14 below.

If any provision of any subcontract or supply agreement is inconsistent with any provision of the Contract Documents or the intent of the Contract Documents, then the Contract Documents shall control.

5-1.13B DISADVANTAGED BUSINESS ENTERPRISES

5-1.13B(1) Nondiscrimination Statement

The contractor, subrecipient or subcontractor will never exclude any person from participation in, deny any person the benefits of, or otherwise discriminate against anyone in connection with the award and performance of any contract covered by 49 CFR 26 on the basis of race, color, sex, or national origin.

5-1.13B(2) Contract Assurance

Under 49 CFR 26.13(b): The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federal-aid contracts. Failure by the contractor to carry out these requirements is a material breach of

this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

1. Withholding monthly progress payments;
2. Assessing sanctions;
3. Liquidated damages; and/or
4. Disqualifying the contractor from future bidding as non-responsible

5-1.13(B)(3) Prompt Payment

The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 days from the receipt of each payment the prime contractor receives from the County. The prime contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the County. This clause applies to both DBE and non-DBE subcontractors.

5-1.13(B)(4) Termination of DBE Subcontracts

The prime contractor must not terminate a DBE subcontractor listed in its Bid (or an approved substitute DBE firm) without prior written consent of the County. This includes, but is not limited to, instances in which the prime contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

The prime contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains written consent from the County. Unless the County's consent is provided, the prime contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

The County may provide such written consent only if the County agrees, for reasons stated in the concurrence document, that the prime contractor has good cause to terminate the DBE firm. For purposes of this paragraph, good cause includes the circumstances listed in 49 CFR § 26.53.
Before transmitting to the County its request to terminate and/or substitute a DBE subcontractor, the prime contractor must give notice in writing to the DBE subcontractor, with a copy to the County, of its intent to request to terminate and/or substitute, and the reason for the request.
The prime contractor must give the DBE five days to respond to the prime contractor's notice and advise the County and the contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the County should not approve the prime contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), the County may provide a response period shorter than five days.

5-1.13C– 5-1.13D RESERVED

5-1.13E CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Each Subcontract or supply agreement is assigned by the Contractor to the County, provided that

1. assignment is effective only after termination of the Contractor's performance by the County, for cause or convenience, and only for those Subcontracts and supply agreements that the County accepts by notifying the Subcontractor, supplier, and Contractor in writing; and
2. assignment is subject to any prior rights of the surety obligated under bond relating to the Contract.

When the County accepts the assignment of a Subcontract, the County assumes the Contractor's rights and obligations under the Subcontract.

5-1.13F JOINT PAYMENTS

The County hereby reserves the right, upon written notice to Contractor, to make payments directly to each Subcontractor, and, if such rights shall be exercised by the County, then such amount shall be credited against the Contract Price due to Contractor hereunder and the County shall be relieved and released from the obligation to make such payment to Contractor and Contractor shall be relieved and released as to the County from the obligation to make such payments to each Subcontractor paid by the County, but not from any of the other obligations and responsibilities of Contractor to the County under the Contract Documents, or from any of the obligations and responsibilities of the Contractor to the Subcontractor under the subcontract.

5-1.13G ARM'S LENGTH TRANSACTIONS AND COMMERCIALLY USEFUL FUNCTION OF SUBCONTRACTORS AND SUPPLIERS

To assure competitive bids and to assure that no bid rigging, unfair practices, collusion or conflicts of interest occur in connection with the work, Contractor agrees that all agreements between Contractor and Subcontractors and suppliers for performance of the work shall be pursuant to arm's length transactions, with unrelated and unaffiliated firms (a "related" or "affiliated" firm is one which is subject to the control of the same persons through joint ownership or otherwise). In all such agreements, each firm shall act in its own best interest, for compensation that reflects the fair market values of the materials or services that are the subject of the transaction.

Contractor further agrees that each Subcontractor and supplier for the work will perform a commercially useful function (i.e., is responsible for the performance, management, and supervision of a distinct element of the work). A Subcontractor or supplier does not perform a commercially useful function when, for example: the work is outside the firm's experience or qualifications; the firm provides little or no supervision of the work; more than fifty percent (50%) of the work designated to be performed by a Subcontractor is performed by a Sub-subcontractor or supplier; the Subcontractor only purchases materials while performing little or no work; the firm works for only one prime contractor; or the same employees work for the firm and the Contractor.

If, upon the County's request, Contractor fails to provide adequate assurances of arm's length transactions or that all Subcontractors and suppliers will perform a commercially useful function, Contractor shall remove such Subcontractor or supplier from the Project, exclude the cost associated with such firm from all Applications for Payment and change order requests and, if

necessary, propose another Subcontractor or supplier to whom the County has no objection, without increase to the Contract Price or Contract Time.

5-1.13H-1.13I RESERVED

5-1.14–5-1.15 RESERVED

5-1.16 REPRESENTATIVE

The Contractor shall designate in writing the name of the Contractor's designated representative at the preconstruction conference. The designated representative shall:

1. Attend all job meetings;
2. Receive the Engineer's orders;
3. Prosecute the Engineer's orders;
4. Supervise the workers; and
5. Coordinate the Subcontractors' work.

The representative must be present at the job site while work is in progress. Submit the representative's name and telephone number so the representative can be easily contacted to perform emergency work while work is not in progress.

5-1.17 CHARACTER OF WORKERS

If a worker appears to the Engineer to be incompetent or acts disorderly or improperly, discharge the worker immediately upon request. Do not employ that worker again on the work.

5-1.18–5.19 RESERVED

5-1.20 COORDINATION WITH OTHER ENTITIES

5-1.20A GENERAL

Other entities may perform work at or near the job site and material sources at any time. Coordinate activities to avoid delays.

Each contractor or other entity performing work at or near the job or material site is responsible to the other for damage to work, persons, or property and for costs due to unnecessary delays.

5-1.20B PERMITS, LICENSES, AGREEMENTS, AND CERTIFICATIONS (PLACS)

5-1.20B(1) General

Comply with PLACs. The County makes PLAC changes under section 4-1.05. Maintain a copy of each PLAC at the job site. Your work will be performed in compliance with the most restrictive condition of the PLACs. The PLACs are attached to the Environmental Permit Summary Form included as an appendix to these Contract Documents.

5-1.20B(2) Reserved

5-1.20B(3) After Award

Confirm with the Engineer which after-award PLACs are obtained by the County and which are obtained by the Contractor. Unless otherwise specified in the Contract Documents, the Contractor shall be responsible for obtaining all PLACs that are required of appropriate for accomplishing the work.

To make a change to an after-award PLAC obtained by the County, submit the proposed change. The Engineer will make an initial determination and may send the proposed change to the appropriate authority for consideration.

Obtain those PLACs to be issued to you and pay fees and costs associated with obtaining them. Submit copies of Contractor-obtained after-award PLACs.

5-1.20B(4) Contractor–Property Owner Agreement

If you elect to dispose of materials at locations other than those where arrangements have been made by the County, or, if material is to be disposed of and the County has not made arrangements for disposal of the material, you must make arrangements for disposing of the materials outside the highway right of way and will pay all costs involved. Arrangements must include, but not be limited to, entering into agreements with property owners and obtaining necessary permits, licenses, and environmental clearances. Before disposing of any material outside the highway right of way, you must furnish to the Engineer satisfactory evidence that you have entered into agreements with the property owners of the site involved and have obtained the permits, licenses, and clearances.

Take material to a permitted disposal site, or provide proof of waiver from the appropriate building or planning official for an exempt site.

You are responsible for obtaining necessary PLACs for new borrow sources or for exceeding limitations on previously cleared sources. No time extension or other waiver of working day requirements will be granted in the event you are delayed if an insufficient quantity of acceptable material is available from environmentally cleared sources to replace excavated material previously disposed of outside the County right of way.

5-1.20C RAILROAD RELATIONS

If the Contract includes an agreement with a railroad company, the County makes the provisions of the agreement available in the in the section titled "Railroad Relations and Insurance Requirements." Comply with these requirements.

5-1.20D OCCUPIED IMPROVEMENTS WITHIN THE RIGHT-OF-WAY

Reserved

5-1.20E WATER METER CHARGES

Reserved

5-1.20F IRRIGATION WATER SERVICE CHARGES

Reserved

5-1.21–5-1.22 RESERVED

5-1.23 SUBMITTALS

5-1.23A GENERAL

Section 5-1.23 includes specification for action and informational submittals.

Any submittal not specified as an informational submittal is an action submittal.

Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the work.

Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the work.

Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the work will be judged.

Shop Drawings, Product Data, Samples, and similar submittals (collectively, "Submittals" are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the work for which the Contract Documents require Submittals. Informational Submittals upon which the County is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the County without action.

The Contractor shall review for compliance with the Contract Documents, approve and submit to the County Submittals required by the Contract Documents in accordance with the timeframes required by the Contract Documents and in such sequence as to cause no delay in the work or in the activities of the County. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the County without action. In all cases, Submittals shall be submitted to the County for review prior to commencing installation of any such work. In the event that the County reasonably determines that all or any portion of any Submittal fails to comply with the requirements of the Contract Documents and/or such Submittals are not otherwise complete and accurate so as to require re-submission more than one (1) time, Contractor shall bear all costs (within the Contract Price) associated with the review and acceptance of such resubmitted Submittals. No adjustment to the Contract Time or the Contract Price shall be granted by the County to the Contractor on account of its failure to make timely submission of any Submittals.

By submitting Submittals, the Contractor represents that the Contractor has: (1) reviewed and approved them; (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so; and (3) checked and coordinated the information contained within such Submittals with the requirements of the work and of the Contract Documents. Submittals must be submitted by the Contractor. Submittals by Subcontractors or suppliers will not be allowed.

The Contractor shall perform no portion of the work for which the Contract Documents require submittal and review of Submittals until the respective Submittal has been reviewed and accepted by the County.

The work shall be in accordance with approved Submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the County's approval of Submittals unless the Contractor has specifically informed the County in writing of such deviation at the time of Submittal and (1) the County has given written approval to the specific deviation as a minor change in the work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the County's approval thereof.

The Contractor shall direct specific attention, in writing or on resubmitted Submittals, to revisions other than those requested by the County on previous Submittals. In the absence of such written notice, the County's approval of a resubmission shall not apply to such revisions.

The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the County will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other Submittals prepared by such professional. Submittals related to the work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the County. The County shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the County has specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this section 5-1.23, the County will review, approve, or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

Each sheet of a submittal must include:

1. Contract number
2. Contract Title
3. Structure name and number, if any

The County rejects a submittal if it has any error or any omission.

If the last day for submitting a document falls on a Saturday, Sunday, or holiday, it may be submitted on the next business day with the same effect as if it had been submitted on the day specified.

Convert foreign language documents to English and U.S. customary units.

5-1.23B ACTION SUBMITTALS

5-1.23B(1) General

Each Submittal must be sequentially numbered, dated, and appropriately titled with the specifications number and description.

Contractor shall maintain a sequential list of Submittals. With each individual Submittal, submit a copy of the updated list to the County.

Submit an action submittal before the start of the affected work to allow for review and corrections without work delays.

Except for test samples, obtain the County's authorization for action submittals before you perform work based on them.

Except for shop drawings and test samples, allow 15 days for review.

For a revised submittal, allow the same number of days for review as for the original submittal.

The time allowed for the review of a submittal starts when the County receives the submittal.

Do not change the scope of work on revised submittals.

The County's authorization of a submittal does not void any Contract part.

5-1.23B(2) Shop Drawings

Submit shop drawings as specified and as otherwise required to control the work.

Each drawing and calculation sheet must be in black ink and sequentially numbered.

Each drawing sheet must:

1. Be 11 by 17 inches
2. Be on minimum of 20 lb paper
3. Have text of minimum nominal height of 5/32 inch

Each calculation sheet must:

1. Be 8-1/2 by 11 inches
2. Have text of a minimum 12-point font

Text and graphics must be legible for photocopying and reduction.

Calculations must demonstrate the design adequacy. Calculations specified as independently checked must be sealed and signed by an engineer who is registered as a civil engineer in the State and who did not seal and sign the drawings.

Allow 20 days for the review.

If multiple sets are submitted simultaneously or an additional set is submitted before the review of a previously submitted set is complete, designate the sequence that the sets are to be reviewed. Allow review time specified plus 15 days for each additional set. A set consists of 40 or fewer sheets.

If drawings require corrections, the County:

1. Describes deficiencies
2. Stamps the drawings with the date that the review stopped
3. Returns the drawings

Show set revision number. Uniquely number each revised detail. Show the number in an inverted triangle near the revised portion of the detail. In a legend, describe and date the revision.

Upon review completion, the County returns 1 copy that shows the authorized date.

To make a change to an authorized drawing, submit it as specified for a new submittal. Note the changes.

After the work shown on the drawings is complete, submit electronic copies of as-built drawings. Include an index of sheet numbers and titles on the 1st sheet for each structure. Arrange the drawings in the drawing-number order shown in the index.

5-1.23B(3) Product Data

Reserved

5-1.23B(4) Samples

Reserved

5-1.23B(5) Test Samples

For test samples, comply with section 6-2.01F.

If requested, obtain the County's authorization for the material before incorporating the material represented by the test sample into the work.

5-1.23B(6) Quality Control Plans

Reserved

5-1.23B(7) Work Plans

Reserved

5-1.23C INFORMATIONAL SUBMITTALS

Informational submittals include:

1. Assignments
2. Certificates of compliance
3. Manufacturer instructions not associated with drawing submittals
4. Notifications
5. PLACs
6. Subcontracts
7. QC test data, QC test results, and QC evaluation reports

5-1.24 CONSTRUCTION SURVEYS

Attention is directed to Section 50-07 of the FAA General Contract Provisions. Stakes or marks are the responsibility of the Contractor and will be set by the Contractor's Land Surveyor as necessary to establish the lines and grades required for completion of the work.

In the event stakes and marks are destroyed or damaged, the stakes and marks will be replaced by the Contractor's Land Surveyor at no cost to the County. The Contractor shall be responsible for all costs associated with setting, replacement, or restoration of construction stakes and marks.

Contractor shall retain the services of a Professional Licensed Land Surveyor (or pre-1982 licensed RCE) for the purposes of Construction Staking, and any other survey services the Contractor will need for the completion of the work under this Contract. The County has CAD files containing base mapping, alignment and profiles for the Contractor's convenience and reference. This information will be provided to the Contractor upon the Contractor's request, prior to construction.

The County has provided survey control, as shown on the project plans. The Contractor's Land Surveyor shall field verify the survey control over the entire job prior to staking and prior to clearing and grubbing, and shall notify the Engineer immediately of any conflicts that will need to be resolved.

The Contractor's Land Surveyor shall provide construction stakes and cut sheets to the Engineer for every 100' Station, plus any additional locations as needed by the Engineer to confirm and verify orderly progression of construction.

Construction stakes and cut sheets provided shall contain sufficient detail to fully construct the project as intended by the plans and specifications. At a minimum, stakes and cut sheets shall identify centerline, hinge points, daylight points, flow line(s), all structures within the roadway prism, and any other such detail points necessary for successful completion of the work by the Contractor and as needed by the Engineer to confirm and verify progression of construction.

Construction stakes shall be labeled with references to plan alignment stations and offsets with stored survey point number for the set hub.

Surveyor's ASCII files or XML files of set points shall be provided to the Engineer for reference and cross-checking when requested by the Engineer.

If the Contractor identifies any conflicts, discrepancies, or missing information on the plans, the Engineer shall be notified immediately.

If the Contractor identifies potential conflict between top/toe of slope and the right of way boundary, the Engineer shall be notified immediately.

5-1.25 - 5-1.26 RESERVED

5-1.27 REPORTS

5-1.27A GENERAL

Reserved

5-1.27B RECORD RETENTION

Retain all project records for at least 3 years after final payment or the resolution of all claims (whichever is later), including but not limited to all records relating to:

1. Bid preparation
2. Overhead
3. Payrolls
4. Payments to Subcontractors and suppliers
5. Cost accounting
6. Claims
7. Accounts receivable and payable
8. Invoices, receipts, subcontracts, and other agreements
9. Notes, correspondence, journals, ledgers, memoranda
10. Any documents generated and received in Contractor's performance of the Contract

Maintain the records in an organized way in the original format, electronic and hard copy, conducive to professional review and audit.

5-1.27C RECORD INSPECTION, COPYING, AND AUDITING

Under Government Code § 8546.7 and 49 CFR 18.36, make your records available for inspection, copying, examination, and auditing by the State Auditor General, County, State, and Federal government representatives for the same time frame specified under section 5-1.27B. The records of Subcontractors and suppliers must be made available for inspection, copying, examination, and auditing by the State Auditor General, County, State, and Federal government

representatives for the same period. All records shall be made available for inspection, copying, examination, and auditing within 5 days of any request or demand therefor.

5-1.27D COST ACCOUNTING RECORDS

Maintain cost accounting records for the project distinguishing between the following work cost categories:

1. Work performed based on bid item prices
2. Change order work. Distinguish this work by:
   2.1. Bid item prices
   2.2. Agreed price
   2.3. Force account
   2.4 Specialist billing
3. Work performed under potential claim records
4. Overhead
5. Work performed by Subcontractors, suppliers, owner-operators, and professional services

Cost accounting records must include:

1. Final cost code lists and definitions
2. Itemization of the materials used and copies of the corresponding vendor's invoices
3. Direct cost of labor
4. Equipment rental charges
5. Workers' certified payrolls
6. Equipment:
   6.1. Size
   6.2. Type
   6.3. Identification number
   6.4. Hours operated

5-1.27E RESERVED

5-1.27F AS-BUILT DRAWINGS

Contractor shall maintain at the job site, and shall make available to the Engineer a set of as-built drawings, which shall be continuously updated during the prosecution of the work, and shall show all deviations and changes to the work, existing conditions, and any other information the Engineer may request in a legible manner.

Contractor's obligation to keep as-built drawings current, and to make them available to the Engineer, is a condition precedent to the County's duty to process Applications for Payment. Contractor's obligations under this section shall survive completion of the work or termination.

5-1.27G CONTRACTOR DAILY REPORTS

The contractor shall complete a daily report indicating location worked, total manpower per construction trade for each bid item, major equipment on site for each bid item, each Subcontractor's manpower and equipment for each bid item, quantities performed for each bid item, weather conditions, and other related information involved in the performance of the work. The daily report forms will be furnished by the Engineer upon request and shall be submitted to the Engineer at the conclusion of each workday. The report shall comment on the daily progress and status of the work performed for each bid item.

5-1.28–5-1.29 RESERVED

5-1.30 NONCOMPLIANT AND UNAUTHORIZED WORK

Correct or remove and replace work that does not comply with the Contract, is unauthorized, or both. The County does not pay for any of the following:

1. Corrective, removal, or replacement work
2. Unauthorized work

If ordered, submit a work plan for the corrective, removal, or replacement work.

The County may reduce payment for noncompliant work left in place.

If you fail to comply promptly with an order under section 5-1.30, the County may correct, remove, or replace noncompliant or unauthorized work. The County deducts the cost of this work.

5-1.31 JOB SITE APPEARANCE

Keep the job site neat. In areas visible to the public:

1. If practicable, dispose of debris removed during clearing and grubbing concurrently with its removal. If stockpiling is necessary, dispose of weekly.
2. Furnish trash bins for debris from construction. Place debris in trash bins daily.
3. Stack forms for falsework to be reused neatly and concurrently with their removal.

If the Contractor fails to clean up as provided in the Contract Documents, the County may do so, and the County shall be entitled to reimbursement from the Contractor.

5-1.32 AREAS FOR USE

Occupy the highway only for purposes necessary to perform the work.

The County does not allow temporary residences within the County right of way.

5-1.33 EQUIPMENT

Reserved

5-1.34–5-1.35 RESERVED

5-1.36 PROPERTY AND FACILITY PRESERVATION

5-1.36A GENERAL

Preserve and protect:

1. Highway improvements and facilities
2 Adjacent property
3. Waterways
4. ESAs
5. Lands administered by other agencies
6. Railroads and railroad equipment
7. Nonhighway facilities, including utilities
8. Survey monuments
9. County’s instrumentation
10. Temporary work
11. Roadside vegetation not to be removed

Comply with Government Code section 4216 et seq. Notify the Engineer at least 3 business days before you contact the regional notification center. Failure to contact the notification center prohibits excavation.

Immediately report damage to the Engineer.

If you cause damage, you are responsible.

The County may make a temporary repair to restore service to a damaged facility.

Install suitable safeguards to preserve and protect facilities from damage.

Install temporary facilities such as sheet piling, cribbing, bulkheads, shores, or other supports necessary to support existing facilities or support material carrying the facilities.

Maintain temporary facilities until they are no longer needed.

Dispose of temporary facilities when they are no longer needed.

Excavate and backfill as necessary to remove temporary facilities. Backfill with materials of equal or better quality and to a comparable density of surrounding materials and grade surface to match the existing grade and cross slope.

5-1.36B LANDSCAPE

If you damage plants not to be removed:

1. Dispose of them unless the Engineer authorizes you to reduce them to chips and spread the chips within the highway at locations designated by the Engineer
2. Replace them

Replace plants with plants of the same species.

Replace trees with 24-inch-box trees.

Replace shrubs with no. 15-container shrubs.

Replace ground cover plants with plants from flats. Replace *Carpobrotus* ground cover plants with plants from cuttings. Plant ground cover plants 1 foot on center.

If a plant establishment or permanent erosion control establishment period is specified, replace plants before the start of the plant establishment period or permanent erosion control establishment period; otherwise, replace plants at least 30 days before Contract acceptance.

Water each plant immediately after planting and saturate the backfill soil around and below the roots or the ball of earth around the roots of each plant. Water as necessary to maintain plants in a healthy condition until Contract acceptance.

5-1.36C RAILROAD PROPERTY

If working on or adjacent to railroad property, do not interfere with railroad operations.

For an excavation on or affecting railroad property, submit work plans showing the system to be used to protect the railroad facilities. Instead of the 15 days specified in section 5-1.23B, allow 65 days for the review of the plans.

If the Contract does not include an agreement with a railroad company, do not allow personnel or equipment on railroad property.

Prevent material, equipment, and debris from falling onto railroad property.

5-1.36D NONHIGHWAY FACILITIES

5-1.36D(1) General

Before starting work that could damage or interfere with underground infrastructure, locate the infrastructure described in the Contract, including laterals and other appurtenances, and determine the presence of other underground infrastructure inferred from visible facilities, such as buildings, meters, and junction boxes.

Underground infrastructure described in the Contract may be in different locations from those described, and additional infrastructure may exist.

Upon discovering an underground main or trunk line not described in the Contract, immediately notify the Engineer and the infrastructure owner. The Engineer orders the locating and protecting of the infrastructure. The locating and protecting is change order work. If ordered, repair infrastructure damage. If the damage is not due to your negligence, the repair is change order work.

Immediately notify the Engineer of a delay due to the presence of main-line underground infrastructure not described in the Contract or in a substantially different location.

Notify the Engineer if the infrastructure described in the Contract cannot be found. If after giving the notice, you find the infrastructure in a substantially different location from that described, finding the infrastructure is change order work.

5-1.36D(2) Nonhighway Facility Protection

Reserved

5-1.36D(3) Nonhighway Facility Rearrangement

The County may rearrange a nonhighway facility during the Contract. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.

The County may authorize facility owners and their agents to enter the highway to perform rearrangement work for their facilities or to make connections or repairs to their property. Coordinate activities to avoid delays.

If necessary, rearrangement of underground infrastructure is not described in the Contract, the Engineer may order you to perform the work. The rearrangement is change order work.

Immediately notify the Engineer of a delay due to a rearrangement different from that described in the Contract.

If you want infrastructure rearrangement different from that described in the Contract:

1. Notify the Engineer
2. Make an arrangement with the infrastructure owner
3. Obtain authorization for the rearrangement
4. Pay the infrastructure owner any additional cost

The County does not adjust time or payment for a rearrangement different from that described in the Contract.

5-1.36E SURVEY MONUMENTS

Pursuant to California Business and Professions Code section 8771(b), protect survey monuments on and off the highway.

Existing survey monuments that are within the work zone are shown on the Project Plans.

Upon discovery of a survey monument not identified and located by the County, immediately:

1. Stop work near the monument
2. Notify the Engineer

Do not resume work near the monument until authorized.

In the event that any existing survey monument is disturbed in any way by the Contractor's operations as determined by a licensed land surveyor or registered civil engineer that is authorized to perform land surveying, they shall be reset accordingly and a Post-Construction Corner Record or Post-Construction Record of Survey shall be submitted to the County Surveyor prior to executing and recording the Notice of Completion and Acceptance.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in resetting any disturbed survey monument and indexing/filing a corner record or Record of Survey, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-1.36F IRRIGATION FACILITIES

Keep existing irrigation facilities in place that are described to be removed, relocated, or modified until the Engineer determines they are no longer needed.

Maintain the existing water supply. If the existing water supply is interrupted for more than 3 consecutive days, provide an alternative water supply. Water the existing plants in the area irrigated from that water supply, including those maintained by the County, as necessary to maintain healthy plant growth.

If you and the County irrigate existing plants from the same water supply, furnish enough water to the County for watering plantings on and off the highway as necessary to maintain a healthy condition through Contract acceptance.

If you damage irrigation facilities not to be removed:

1. Remove and dispose of them.
2. Repair and replace damaged facilities within 10 days.
3. Use similar commercial-quality components from the same manufacturer or components that are compatible with the existing irrigation system if authorized.
4. After completing the repair or replacement of the facilities, perform an operational test in the presence of the Engineer. If you repair or replace the remote-control valves, conduct the test with the irrigation controller in the automatic mode.

Notify the Engineer:

1. At least 4 business days before shutting off the water supply to any portion of the existing irrigation system
2. Immediately after restoring the water supply to any portion of the existing irrigation system

5-1.37 MAINTENANCE AND PROTECTION

5-1.37A GENERAL

Maintain and protect work until the County has granted relief from maintenance or accepted the Contract.

Do not remove any padlock used to secure a portion of the work until the Engineer is present to replace it. Notify the Engineer at least 3 days before removing the lock.

Prevent construction equipment that exceeds the maximum weight limits in Vehicle Code Division 15 from operating on completed or existing treated base, pavement, or structures.

5-1.37B LOAD LIMITS

5-1.37B(1) General

For areas within the project limits and subject to the Contractor providing protective measures and repairing related damage, construction equipment exceeding the size or weight limits in Vehicle Code Division 15 may move over:

1. Public roads within the highway
2. Treated base or pavement under construction or completed
3. Culverts and pipes
4. Structures not open to traffic that are designed for AASHTO HS20-44 live loading, except culverts and pipes. Before crossing one of these structures, submit the dimensions and maximum axle loadings of the equipment; and unless a material hauling equipment lane on a bridge is shown on the drawings, comply with the following specifications:
   4.1. The maximum loading on a bridge due to pneumatic-tired truck and trailer combinations must not exceed:
      4.1.1. 28,000 lb for single axles
      4.1.2. 48,000 lb for tandem axles
      4.1.3. 60,000 lb total gross load for single vehicles
      4.1.4. 110,000 lb total gross load for truck and trailer or semi-trailer combinations
   4.2. The loading on a bridge due to 2- and 3-axle pneumatic tired earthmovers must not exceed that shown in the following table:

Allowable Construction Loading on Bridges for 2- and 3-Axle Earthmovers

Bridge girder center-to-center spacing (feet)	Maximum axle loading (pounds)
4	28,000
5	29,000
6	30.000
7	32,000
8	34,000
9	37,000
10 and over	40,000

NOTE: Minimum axle spacing:

For 2-axle earthmovers:
Axles 1 to 2 = 20 feet

For 3-axle earthmovers:
Axles 1 to 2 = 8 feet
Axles 2 to 3 = 20 feet

5. Completed or existing base, pavement, and structures under Caltrans' *Transportation Permits Manual*, whether open to the public or not

Loads imposed on existing, new, or partially completed structures must not exceed the load carrying capacity of the structure or any portion of the structure as determined by AASHTO LRFD

with interims and California Amendments, Design Strength Limit State II. The f'_c to be used in computing the load carrying capacity must be the smaller of the following:

1. Actual compressive strength at the time of loading
2. Value of f'_c shown on the plans for that portion of the structure or 2.5 times the value of f_c shown on the plans for portions of the structure where no f'_c is shown

5-1.37B(2) Increased Load Carrying Capacity

You may submit a request to the County to redesign a structure to increase its load carrying capacity.

The County does not authorize a redesign for any of the following:

1. Load increase more than 130,000 lb per single axle or pair of axles less than 8 feet apart
2. Total gross vehicle weight more than 330,000 lb

Your request to the County must include:

1. Description of the structure or structures
2. Detailed overload description
3. Date the revised plans are required
4. Signed statement agreeing to pay the costs, including the engineering costs
5. Signed statement agreeing to waive a time extension request for any delay

If the County authorizes a redesign to strengthen the structure, the Engineer notifies you of the change's estimated cost and availability date of the revised plans. If the cost and date are satisfactory to you, the Engineer prepares a Change Order for the changes.

5-1.37B(3) Material Hauling Equipment Lane on Bridges

Section 5-1.37B(3) applies to a bridge constructed with a material hauling equipment lane.

You may cross the bridge with pneumatic-tired material hauling equipment that exceeds the size and weight limits specified but that does not exceed the load limits shown on the material hauling equipment loading diagram on the plans.

For each bridge with a material hauling equipment lane:

1. Construct a minimum 150-foot approach at each bridge end to a grade that provides a smooth transition to the bridge roadway grade. Maintain these approaches in a smooth and uniform condition during the operation of the equipment.
2. Operate equipment such that jolting and bouncing of the equipment while crossing the bridge is prevented.
3. Confine equipment to the material hauling lane using temporary barriers unless the plans show that the entire bridge may be used for hauling equipment and the permanent barriers are completed.
4. Allow at most 1 piece of equipment on the bridge at one time.

If ordered, verify the weight of loaded material hauling equipment by weighing. The County furnishes individual wheel or axle type scales. The County weighs the equipment within the project limits and within the highway at a location accessible to the equipment. You determine the exact weighing location. Install and maintain the scales. Installing and maintaining scales is change order work.

5-1.38 MAINTENANCE AND PROTECTION RELIEF

Reserved.

5-1.39 DAMAGE REPAIR AND RESTORATION

5-1.39A GENERAL

Before Contract acceptance, restore damaged work to the same state of completion as before the damage. Restoration of damaged work includes restoration of erected falsework and formwork. See also section 5-1.47 regarding guarantee and corrective work.

The County does not adjust payment for repair or restoration that the Engineer determines was caused by your failure to construct the work under the Contract or protect the work.

5-1.39B DAMAGE CAUSED BY AN ACT OF GOD

Under Public Contract Code § 7105, the County pays for repair or restoration to damaged work in excess of 5 percent of the total Bid if the damage was caused by an act of God.

Submit a request for repair or restoration work payment before performing work other than emergency work.

The Engineer determines the repair or restoration work cost under section 9-1.04 except markups are not allowed.

The County may change the Contract for the areas requiring repair or restoration. If the cost for the changes exceeds the repair or restoration cost based on the Bid Item List, the Engineer determines the payment adjustment under section 9-1.04.

5-1.39C LANDSCAPE DAMAGE

5-1.39C(1) General

Reserved

5-1.39C(2) Plant Establishment Period of 3 Years or More

Reserved

5-1.40–5-1.41 RESERVED

5-1.42 REQUESTS FOR INFORMATION

Submit an RFI upon recognition of any event or question of fact arising under the Contract.

The Engineer responds to the RFI within 5 business days. Proceed with the work unless otherwise ordered. You may protest the Engineer's response by:

1. Submitting an Initial Potential Claim Record within 5 business days after receiving the Engineer's response.
2. Complying with section 5-1.43

5-1.43 CLAIMS

5-1.43A GENERAL

5-1.43A(1) Mandatory Procedure and Condition Precedent

Any demand or assertion by the Contractor seeking an adjustment of Contract Price and/or Contract Times, or other relief, for any reason whatsoever, must be in strict compliance with the

requirements of this section 5-1.43. For purposes of this section 5-1.43, any and all work relating to any such demand or assertion shall be referred to as "Disputed Work", regardless of whether the basis of the demand or assertion arises from an interpretation of the Contract Documents, an action or inaction of the Contractor, the Engineer, or the County, or any other event, issue, or circumstance. The Contractor shall bear all costs incurred in complying with the provisions of this section 5-1.43.

Compliance with these requirements is a condition precedent to the Contractor's ability to exercise any rights or remedies that may otherwise be available to Contractor under the Contract Documents or any applicable Laws or Regulations relating to the Claim. No action or inaction by the Contractor or the Engineer to try to resolve any Claim(s) through agreement (including Change Order), mediation, settlement, or any other means shall excuse the Contractor from complying with the requirements of this section 5-1.43.

Any and all references to section 5-1.43 in these Contract Documents refers to subsections 5-1.43A thru 5-1.43H, and every subsection within those subsections. Section 5-1.43 shall be interpreted in a manner consistent with Public Contract Code sections 9204 and 20104 - 20104.6. To the extent there is any conflict between section 5-1.43 and these statutes, the statutory provisions shall prevail. The text of Public Contract Code sections 9204 and 20104 -20104.6 are included in section 7-1.02L of these Contract Documents.

5-1.43A(2) Contractor's Continuing Obligations

At all times during the processing of the Contractor's potential Claim, the Contractor shall diligently proceed with the performance of the Disputed Work and other work, unless otherwise specified or directed by the Engineer.

The Contractor shall provide the Engineer the opportunity to examine the site of the Disputed Work as soon as reasonably possible, and in no event later than 5 days from the date of the Initial Notice of Potential Claim. Throughout the processing of the Contractor's potential Claim, the Contractor shall provide the Engineer a reasonable opportunity to examine the site of the Disputed Work within 5 days of the date of Engineer's written request therefor.

The Contractor shall promptly respond to any requests for further information or documentation regarding the Contractor's potential Claim. If the Contractor fails to provide an adequate written response to the Engineer within 15 days of the Engineer's written request for such further documentation or information, the Contractor shall be deemed to have waived its Claim. If the further documentation or information requested by the Engineer would, in the opinion of the Engineer, reasonably take the Contractor more than 15 days to comply with, the written request shall provide the Contractor a specific response deadline that is commensurate to a reasonable response time.

Throughout the performance of the Disputed Work, the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of Disputed Work and other work. The Contractor shall allow the Engineer access to its Project records deemed necessary by the Engineer to evaluate the potential Claim within 15 days of the date of the Engineer's written request. The Contractor's failure to comply with the provision of this section 5-1.43 shall constitute a waiver of the Contractor's Claim.

All Subcontractor's and material supplier's claims of any type shall be brought only through Contractor pursuant to the provisions of this section 5-1.43. Under no circumstances shall any Subcontractor or material supplier make any direct claim against County.

Except where provided by law, or elsewhere in these Contract Documents, THE COUNTY SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES AND THE CONTRACTOR SHALL NOT INCLUDE THEM IN ITS CLAIMS. Contractor shall be limited in its recovery on any Claim(s) to the adjustments allowed in the Contract Documents.

During each step in the processing of the Contractor's Claim, each notice shall be accompanied by the Contractor's written statement that the adjustment or relief claimed is the entire adjustment or relief to which the claimant believes it is entitled as a result of the event, issue, or circumstance giving rise to the Claim.

The Contractor shall be responsible for providing written evidence of the date any of the notices referenced in section 5-1.43 above were provided to Engineer, and shall provide Engineer a copy of such written evidence within 5 days of a request thereof. Such evidence shall be either a written receipt of actual delivery from U.S. Postal Service or other reputable delivery service, or by the recipient's written acknowledgement of receipt.

The rights of the Engineer to request further records, documents, or information from the Contractor regarding a Claim are for the sole benefit of the Engineer, and may be exercised at their sole discretion. Any failure by the Engineer to exercise its rights does not provide the Contractor any excuse for not providing all of the records, documents, and other information it is requested to provide under section 5-1.43 or any other provision of the Contract Documents.

Under no circumstances may the Contractor submit an Initial Notice of Potential Claim, Supplemental Notice of Potential Claim, or Notice of Final Claim after the date of final payment.

5-1.43A(3) Claim Identification Number

The Contractor shall assign an exclusive identification number for each potential Claim, determined by chronological sequencing, based on the date of the potential Claim. The nature and circumstances involved in the dispute shall remain consistent throughout the processing of the Claim.

The exclusive identification number for each Claim shall be used on the following corresponding documents:

1. Initial Notice of Potential Claim.
2. Supplemental Notice of Potential Claim.
3. Notice of Final Claim.
4. Contractor's written statement of Claims

5-1.43B INITIAL NOTICE OF POTENTIAL CLAIM

Promptly upon becoming aware of any event, issue, or circumstance which the Contractor believes provides a basis for an adjustment of Contract Price and/or Contract Times, or other relief, Contractor shall provide a signed written Initial Notice of Potential Claim to the Engineer. The Initial Notice of Potential Claim shall be submitted before commencing any Disputed Work, or within 5 days of the event, issue, or circumstance from which the Claim arises, whichever is earlier.

The Initial Notice of Potential Claim shall clearly state the Contractor's grounds for seeking an adjustment in Contract Price and/or Contract Times or other relief, the nature and circumstances of the Disputed Work, the relief or adjustment sought by the Contractor for the Disputed Work. The Initial Notice of Potential Claim shall be submitted on a form furnished by the Engineer and

shall be certified under penalty of perjury with reference to the California False Claims Act, Government Code Sections 12650-12655.

After reviewing the Initial Notice of Potential Claim, the Engineer may provide a written response thereto or may decide to delay providing a response until the Contractor provides further information regarding the potential Claim pursuant to the provisions of this section 5-1.43.

5-1.43C SUPPLEMENTAL NOTICE OF POTENTIAL CLAIM

Within 15 days of submitting the Initial Notice of Potential Claim, the Contractor shall submit a signed Supplemental Notice of Potential Claim to Engineer that provides the following information:

1. The complete nature and circumstances of the dispute which caused the potential Claim.
2. The contract provisions that provide the basis of the potential Claim.
3. The requested adjustment of Contract Price, if any, and the estimated cost of the potential Claim, including an itemized breakdown of individual costs and how each estimate was determined.
4. The requested adjustment of Contract Time, if any, and a time impact analysis of the schedule that illustrates the effect on the scheduled completion date due to schedule changes or disruptions.

The information provided by the Contractor shall provide the Contractor's complete reasoning for additional compensation or adjustments and shall be as complete as reasonably possible.

The Supplemental Notice of Potential Claim shall be submitted on a form furnished by Engineer and shall be certified under penalty of perjury with reference to the California False Claims Act, Government Code Sections 12650-12655. If at any time the estimated cost of the potential Claim or effect on the Progress Schedule changes, Contractor shall update information in items 3 and 4 above as soon as the change is recognized and submit this information to Engineer.

If the Disputed Work is not completed within 30 days, the Contractor shall, every 30 days until the Disputed Work ceases, submit to the Engineer an updated Supplemental Notice of Potential Claim that shall update and quantify all of the information required in the Supplemental Notice of Potential Claim. The Contractor’s failure to so quantify costs and schedule impacts every 30 days shall result in a waiver of the Claim for that 30-day period. Any supplemental notice or updated notice that states that the requested adjustment of Contract Price and/or Contract Time will be provided or determined at a later date, or that any damages, costs, schedule impacts, and/or any other analysis will be provided or determined at a later date, shall be deemed to be not in compliance with this section 5-1.43, and shall result in the Contractor waiving its Claim.

After reviewing the Supplemental Notice of Potential Claim or updated Supplemental Notice of Potential Claim, the Engineer may provide a written response thereto or may decide to delay providing a response until the Contractor provides further information regarding the potential Claim pursuant to the provisions of this section 5-1.43.

5-1.43D NOTICE OF FINAL CLAIM

As soon as reasonably practical upon completion of the Disputed Work, and no later than 30 days after completion of the Disputed Work, the Contractor shall submit to the Engineer a Notice of

Final Claim containing a full and final documentation of the Claim including, but not limited to, the following information:

1. A detailed factual narration of events fully describing the nature and circumstances that caused the dispute, including, but not limited to, necessary dates, locations, and items of work affected by the dispute.
2. The specific provisions of the Contract that support the Claim and a statement of the reasons these provisions support and provide a basis for entitlement of the Claim.
3. When additional monetary compensation is requested, the exact amount requested calculated in conformance with the Contract Documents and shall include an itemized breakdown of individual costs. These costs shall be segregated into the following cost categories:
    a. Labor – A listing of individuals, classifications, regular hours and overtime hours worked, dates worked, hourly labor rates, and other pertinent information related to the requested reimbursement of labor costs.
    b. Materials – Invoices, purchase orders, location of materials either stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information related to the requested reimbursement of material costs.
    c. Equipment – Listing of detailed description (make, model, and serial number), hours of use, dates of use, and equipment rates. Equipment rates shall be at the applicable State rental rate as listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," in effect when the Disputed Work was performed.
    d. Other categories as specified by Contractor or Engineer.
4. When an adjustment of Contract Time is requested the following information shall be provided:
    a. The chronology of the specific dates for which Contract Time is being requested.
    b. The specific reasons for entitlement to a Contract Time adjustment.
    c. The specific provisions of the Contract that provide the basis for the requested Contract Time adjustment.
    d. A detailed time impact analysis of the schedule. The time impact analysis shall show the effect of changes or disruptions on the scheduled completion date to demonstrate entitlement to a Contract Time adjustment.
5. The listing, identification, and production of copies of all documents the Contractor believes support its Claim and the date, time, circumstances, details and substance of any oral communications that the Contractor believes support the Claim.

The Notice of Final Claim shall be submitted on a form furnished by the Engineer and shall be certified under penalty of perjury with reference to the California False Claims Act, Government Code Sections 12650-12655.

Information submitted subsequent to the Notice of Final Claim will not be considered.

No Notice of Final Claim will be considered that does not have the same nature and circumstances, and basis of Claim as those specified on the Initial and Supplemental Notices of Potential Claim.

5-1.43E RESPONSE TO NOTICE OF FINAL CLAIM

5-1.43E(1) Date of Final Decision in Response to Final Claim

In the event a valid written decision is not provided to the Contractor within the time prescribed in this section 5-1.43, the Claim shall be deemed denied on the last day a written response was due. The date upon which the Claim is approved or denied pursuant to the provisions of this section 5-1.43, shall constitute the date of the final decision on the Claim under the provisions of this section 5-1.43. The date of the final decision on a Claim can only be changed by a subsequent writing signed by Engineer and County that expressly states that the date of the final decision on the Claim has been changed to a new specific date."

5-1.43E(2) Public Contract Code Requirements for Claims Less Than or Equal to $375,000

5-1.43E(2)(a) Written Response to Claims of less than $50,000

For Claims of less than fifty thousand dollars ($50,000), the Engineer shall respond in writing to the Notice of Final Claim within 45 days of receipt thereof, or may request, in writing, within 30 days of said receipt, any additional documentation relating to the Claim or any defenses to the Claim the County may have against the Contractor. The Contractor shall comply with the request within the reasonable time deadlines provided by the Engineer in the request. If additional information is thereafter required, it shall be requested and provided upon mutual agreement of the County and the Contractor. The written response to the Notice of Final Claim shall be submitted to the Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

5-1.43E(2)(b) Written Response to Claims Over $50,000 and Less Than or Equal to $375,000

For Claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the Engineer shall respond in writing to the Notice of Final Claim within 45 days of receipt thereof, or may request, in writing, within 30 days of said receipt, any additional documentation relating to the Claim or any defenses to the Claim the County may have against the Contractor. The Contractor shall comply with the request within the reasonable time deadlines provided by Engineer in the request. If additional information is thereafter required, it shall be requested and provided upon mutual agreement of the County and the Contractor. The written response to the Notice of Final Claim shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

5-1.43E(2)(c) Right to Meet and Confer For Claims Less Than or Equal to $375,000

For Claims less than or equal to $375,000, if the Contractor disputes the written response to the Claim, or if a written response is not submitted within the time prescribed above, the Contractor may so notify the Engineer and County, in writing, either within 15 days of receipt of the written response or within 15 days of the Engineer's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon such a timely demand by the Contractor, the Engineer shall schedule a meet and confer conference within 30 days for settlement of the dispute. Within 30 days after such conference, a final written response to the Claim shall be issued which will serve as the new final decision on the Claim. Pursuant to Public Contract Code section 20104.6, the County shall not fail

to pay money as to any portion of a Claim which is undisputed, except as otherwise provided in the Contract Documents.

5-1.43E(3) For Claims Greater Than $375,000

For Claims over three hundred seventy-five thousand dollars ($375,000), the Engineer shall respond in writing to the Notice of Final Claim within 45 days of receipt thereof Claim, or may request, in writing, within 30 days of said receipt, any additional information or documentation relating to the Claim or any defenses to the Claim the County may have against the Contractor. The Contractor shall comply with the request within the reasonable time deadline provided by the Engineer in the request. If any additional information is thereafter requested by the Engineer, it shall likewise be provided by the Contractor within the reasonable time deadline provided by the Engineer in such follow-up request. The written response to the Notice of Final Claim shall be submitted to the Contractor within 30 days after receipt of such further information and documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or documentation, whichever is greater. The Contractor may request an informal conference to meet and confer for settlement of the issues in dispute, but the Contractor shall have no right to demand such a conference. Neither the requesting of any such conference by the Contractor or the Engineer, nor the holding of such conference shall affect the date of the final decision on the Claim. No written communications of the Engineer and/or the County sent to the Contractor after any such conference will change the date of the final decision on the Claim unless the writing expressly states that the date of the final decision is being changed to a new specific date.

5-1.43F EXCLUSIVE REMEDY

The administration of a Claim as provided in this section 5-1.43, including the Contractor's performance of its duties and obligations specified in this section 5-1.43 is the Contractor's sole and exclusive remedy for disputes of all types pertaining to the payment of money, extension of time, the adjustment or interpretation of the Contract Documents terms or other contractual or tort relief arising from the Contract Documents. This exclusive remedy and the limitation of liability (expressed herein and elsewhere throughout the Contract Documents) apply notwithstanding the completion, termination, suspension, cancellation, breach, or rescission of the work or the Contract Documents, the negligence or strict liability of the County, its representatives, consultants, or agents, or the transfer of work or the Project to the County for any reason whatsoever.

The Contractor waives and covenants not to raise any claims of waiver, estoppel, release, bar, or any other type of excuse for non-compliance with these section 5-1.43 requirements. Compliance with the procedures described in this section 5-1.43 is a condition precedent to the right to file a Government Code Claim, commence litigation, or commence any other legal action. Claim(s) or issue(s) not raised in a timely Claim submitted under this section 5-1.43 may not be asserted in any subsequent Government Code Claim, litigation, or legal action. The County shall not be deemed to waive any provision under this section 5-1.43, if at the County's sole discretion, a claim is administered in a manner not in accordance with this section 5-1.43.

5-1.43G GOVERNMENT CODE CLAIM REQUIREMENTS

For all Claims not resolved as a result of the section 5-1.43 procedures, the Contractor must submit each Claim in a Government Code Section 910 form of claim for final investigation and consideration of its settlement prior to initiation of any litigation on any such Claim, as required

by Government Code Section 945.4. Pursuant to Government Code Section 930.2, the one-year period in Government Code Section 911.2 is hereby reduced to 150 days. This time deadline is measured from the accrual date of each separate cause of action.

5-1.43H TOLLING

For each unresolved Claim properly processed by the Contractor in accordance with section 5-1.43, the running of the period of time within which a Government Code claim must be submitted shall be tolled during the time the Contractor is processing the Claim in compliance with section 5-1.43. Under no circumstances shall the time for submitting a Government Code Claim be extended beyond 150 days of the date of the final decision on the Claim under section 5-1.43. The Contractor waives the right to pursue or submit any Claims not processed in accordance with section 5-1.43.

Other than as expressly provided above, the time deadline for filing a Government Code claim shall not be tolled by any action or inaction by the Contractor, the Engineer, or the County, including but not limited to any action or inaction to try to resolve the Claim through negotiation, mediation, settlement, agreement (including Change Order), or by any other means, other than by a separate written tolling agreement expressly approved as to form (on the face of the agreement) by the County.

5-1.44–5-1.45 RESERVED

5-1.46 FINAL INSPECTION AND CONTRACT ACCEPTANCE

Attention is directed to Section 50-15 of the FAA General Contract Provisions. When you complete the work, request the Engineer's final inspection.

If the Engineer determines that the work is complete, the Engineer makes a formal recommendation to the Director to start the County’s internal procedures that allow the Board of Supervisors (or its authorized designee) to accept the work by executing and recording a Notice of Completion and Acceptance.

5-1.47 GUARANTEE

Guarantee that work remains free from substantial defects for 1 year after Contract acceptance except for work parts for which you were relieved of maintenance and protection. Guarantee each of these relieved work parts for 1 year after the relief date.

The guarantee excludes damage or displacement caused by an event outside your control, including:

1. Normal wear and tear
2. Improper operation
3. Insufficient maintenance
4. Abuse
5. Unauthorized change
6. Act of God

During the guarantee period, repair or replace each work part having a substantial defect.

The County does not pay for corrective work.

During corrective work activities, provide the same insurance specified before Contract acceptance.

The Contract bonds must be in force until the later of (1) the expiration of the guarantee period or (2) the completion of the corrective work.

If a warranty specification conflicts with section 5-1.47, comply with the warranty specification.

During the guarantee period, the Engineer monitors the completed work. If the Engineer finds work having a substantial defect, the Engineer lists the defective work parts and furnishes you the list.

Within 10 days of receipt of the list, submit for authorization a detailed plan for correcting the work. Include a schedule that includes:

1. Start and completion dates
2. List of labor, equipment, materials, and any special services you plan to use
3. Work related to the corrective work, including traffic control and temporary and permanent pavement markings

The Engineer notifies you when the plan is authorized. Start the corrective work and related work within 15 days of notice.

If the Engineer determines corrective work is urgently required to prevent injury or property damage:

1. The Engineer furnishes you an order to start emergency repair work and a list of parts requiring corrective work
2. Mobilize within 24 hours and start work
3. Submit a corrective work plan within 5 business days of starting the emergency repair work

If you fail to perform the work as specified, the County may perform the work and bill you.

5-1.48–5-1.50 RESERVED

6 CONTROL OF MATERIALS

6-1 GENERAL

6-1.01 GENERAL

Section 6 includes specifications related to the control of materials.

Store materials and samples in a way that preserves the quality and facilitates prompt inspection.

Material incorporated into the work must be new.

Before the preconstruction conference, submit material source information on a *Notice of Materials to Be Used* form.

6-1.02 COUNTY-FURNISHED MATERIALS

Request County-furnished material except sign panels at least 15 days before their scheduled installation. Request sign panels at least 30 days before their scheduled installation.

If the County furnishes the material:

1. At the job site, unload and store the material
2. At a location other than the job site, deliver the material to the job site and store it

The Engineer orders the return and disposal of surplus County-furnished material. This returning and disposing of material is change order work.

You are responsible for the cost of replacing County-furnished material. The County deducts replacement costs. County-furnished material not used in the work remains the property of the County.

6-1.03 LOCAL MATERIALS

Local material must be must be rock, sand, gravel, earth, or mineral material other than local borrow or selected material obtained or produced from a source in the work vicinity, specifically for use on the project. Local borrow must not be a material from an established commercial source.

Upon your request, the County tests material from an untested local source. If satisfactory material from that source is used in the work, the County does not charge you for the tests; otherwise, the County deducts the test costs.

6-1.04 BUY AMERICA

6-1.04A GENERAL

Attention is directed to Section A4 of the Required Federal Contract Provisions.

6-1.04B CRUMB RUBBER (PUBLIC RESOURCES CODE § 42703(D))

Furnish crumb rubber with a certificate of compliance. Crumb rubber must be:

1. Produced in the United States
2. Derived from waste tires taken from vehicles owned and operated in the U.S

6-1.04C STEEL AND IRON MATERIALS

Reserved

6-1.04D MANUFACTURED PRODUCTS

Reserved

6-1.04E CONSTRUCTION MATERIALS

Reserved

6-1.05 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION

A reference to a specific brand or trade name establishes a quality standard and is not intended to limit competition. You may use a product that is equal to or better than the specified brand or trade name if authorized.

Submit a substitution request with a time period that:

1. Follows Contract award
2. Allows 30 days for review
3. Causes no delay

Include substantiating data with the substitution request that proves that substitution:

1. Causes no delay
2. Is of equal or better quality and suitability

If the data provided to the County in support of a substitution request is incomplete or otherwise insufficient to prove the two points above, the Engineer may either deny the request outright or provide the Contractor the opportunity to provide additional information in support of its request. If the Contractor is provided an opportunity to resubmit additional information, the County has 30 days to review such additional information. The Contractor shall not be entitled to any extension of the Contract Time for the time involved in the substitution request process.

6-2 QUALITY ASSURANCE

6-2.01 GENERAL

6-2.01A GENERAL

Section 6-2 includes provisions related to quality.

The County uses a QAP to ensure material complies with the Contract. The County may use multiple QA methods for a material.

The County may inspect, sample, and test materials for compliance with the contract at any time.

Allow the County to record, including photograph and video record, to ensure a material is produced to comply with the Contract.

You may examine the records and reports of tests the County performs if they are available at the job site.

Schedule work to allow time for QA.

The County deducts testing costs for work that does not comply with the Contract.

The County may retest material previously tested and authorized for use. If the County notifies you of a retest, furnish resources for retesting.

6-2.01B AUTHORIZED FACILITY AUDIT LISTS

Section 6-2.01B applies where a facility is specified to be on an Authorized Facility Audit List.

An audit authorized by Caltrans not more than 3 years before completion of the fabrication process is acceptable if the County determines the audit was for the same type of work to be performed.

For procedures to be included on an Authorized Facility Audit List, go to the Caltrans Authorized Facility Audit List website:

https://mets.dot.ca.gov/afl/AuditedFacilitiesList.php

6-2.01C AUTHORIZED MATERIAL LISTS

Section 6-2.01C applies where a material is specified to be on an Authorized Material List.

The material must be on an Authorized Material List before it is incorporated into the work.

For procedures to be included on an Authorized Material List, go to the Caltrans Authorized Material List website:

https://dot.ca.gov/programs/engineering-services/authorized-materials-lists

6-2.01D AUTHORIZED MATERIAL SOURCE LISTS

Section 6-2.01D applies where a material is specified to be on an Authorized Material Source List.

The material source must be on an Authorized Material Source List before the item from the source is incorporated into the work.

For procedures to be included on an Authorized Material Source List, go to the Authorized Material List website.

6-2.01E MATERIAL SOURCE INSPECTION AND TESTING

Section 6-2.01E applies if a material is to be inspected or tested at the source.

Submit an inspection request form:

1. At least 3 business days before the requested inspection date for a material source within California.
2. At least 5 business days before the requested inspection date for a material source outside California but within the United States.
3. 50 days before the planned production start for a material source outside the United States. Notify the Engineer at least 20 days before the actual start.

For the inspection request form and the procedure for its submittal, go to the METS website. Notify the Engineer of each submittal.

6-2.01F TEST SAMPLES

Section 6-2.01F applies where a test sample is specified or if a test sample is requested.

Notify the Engineer 10 days before taking a sample.

Submit material to be tested with a Sample Identification Card. For the card, go to the METS website.

Restore work immediately after sampling.

If requested, obtain the County's authorization for the material before incorporating the material represented by the test sample into the work.

6-2.01G–6-2.01K RESERVED

6-2.02 QUALITY CONTROL

6-2.02A GENERAL

Material production and testing equipment must measure accurately and precisely.

6-2.02B QUALITY CONTROL PROGRAM

Develop, implement, and maintain a QC program. Attention is directed to Section 60-02 of the FAA General Contract Provisions.

Prepare and maintain QC records, including:

1. Names and qualifications of:
   1.1. Samplers
   1.2. Testers
   1.3. Inspectors
2. Testing laboratories' identification and certifications
3. Testing equipment calibrations and certifications
4. Inspection reports
5. Sampling and testing records organized by date and type of material
6. Test results with comparison of quality characteristic requirements
7. Test results in relation to action and any suspension limits
8. Records of corrective actions and suspensions

Within 24 hours, notify the Engineer of any noncompliance identified by your QC program.

Allow the County access to all QC records.

Submit QC test data and QC test results within 2 business days of test completion.

6-2.02C QUALITY CONTROL MANAGER

Attention is directed to Section 60-02 of the FAA General Contract Provisions. Section 6-2.02C applies to work requiring a QC manager.

The QC manager must be responsible directly to you for the quality of the work, including materials and workmanship performed by you and your Subcontractors.

Assign the QC manager before the start of the affected work. The QC manager must be the sole individual responsible for:

1. Receiving, reviewing, and approving all correspondence, submittals, and reports before they are submitted to the County
2. Signing the QC plan
3. Implementing the QC plan
4. Maintaining the QC records

The QC manager must be your employee or must be hired by a Subcontractor providing only QC services. The QC manager must not be employed or compensated by a Subcontractor or by other persons or entities hired by Subcontractors who will provide other services or materials for the project.

Notify the Engineer of the name and contact information of the QC manager.

6-2.02D QUALITY CONTROL PLANS

Reserved

6-2.03 DEPARTMENT ACCEPTANCE

6-2.03A GENERAL

The County may use multiple acceptance methods for a material.

Specifications in sections titled "Department Acceptance" do not include all requirements on which the County makes its acceptance.

The County may inspect, sample, and test materials for compliance with the Contract at any time.

Allow the County to record, including photograph and video, to ensure a material is produced to comply with the Contract.

You may examine the records and reports of tests the County performs.

Schedule work to allow time for the County's inspection, sampling, and testing.

The County deducts testing costs for work that does not comply with the Contract.

The County may retest material previously tested and authorized for use. If the County notifies you of a retest, furnish resources for retesting.

6-2.03B JOB SITE INSPECTION AND TESTING

Section 6-2.03B applies if a material is to be inspected or tested at the job site.

The material must be authorized for use before it is incorporated into the work.

6-2.03C CERTIFICATES OF COMPLIANCE

Section 6-2.03C applies (1) where a certificate of compliance is specified and (2) if any material is produced outside the United States.

Submit a certificate of compliance:

1. Before the material is incorporated into the work
2. For each lot of the material. Identify the lot on the certificate
3. Signed by the producer of the material and stating that the material complies with the Contract

7 LEGAL RELATIONS & RESPONSIBILITY TO THE PUBLIC

7-1.01 GENERAL

Attention is directed to Section 70 of the FAA General Contract Provisions. Section 7 includes specifications regarding your:

1. Compliance with laws
2. Responsibilities for public safety and convenience
3. Responsibilities for indemnification, insurance, and liability

7-1.02 LAWS

7-1.02A GENERAL

Comply with laws, regulations, orders, and decrees applicable to the project. Indemnify and defend the County against any claim or liability arising from the violation of a law, regulation, order, or decree by you or your employees. Immediately report to the Engineer a discrepancy or inconsistency between the Contract and a law, regulation, order, or decree.

If the County incurs any fines or penalties because of your failure to comply with a law, regulation, order, or decree, the County deducts the amount of the fine or penalty.

Immediately notify the Engineer if a regulatory agency requests access to the job site or to records. Submit a list of documents provided to the agency and issued enforcement actions.

Only those sections or provisions of Chapter 1 of Part 2 of Division 2 of the Public Contract Code § 10100 et seq. which are specifically incorporated into the contract documents apply to this Contract. All other sections and provisions of Chapter 1 of Part 2 of Division 2 of the Public Contract Code do not apply.

Financing for this project is provided in part by a Federal Emergency Management Agency (FEMA) Public Assistance grant and that compliance with applicable federal laws, regulations, executive orders, and FEMA policies, procedures, and directives is required. The federal government is not a party to this Contract and is not subject to any obligations or liabilities to the County, the Contractor, or any other party pertaining to any matter resulting from this Contract.

The Contractor shall not use the Department of Homeland Security (DHS) seal(s), logo, crest, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval.

7-1.02B U.S. FAIR LABOR STANDARDS ACT

Comply with 29 USC § 201 et seq.

7-1.02C RESERVED

7-1.02D CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

The Contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act of 1970 (42 USC 7401 *et seq.*) as amended, the Clean Water Act (33 USC 1251 *et seq,*) as amended, Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15). Violations will be reported to the appropriate authorities.

7-1.02E–7-1.02H RESERVED

7-1.02I GOVERNMENT CODE

7-1.02I(1) General

Reserved

7-1.02I(2) Nondiscrimination

Pursuant to Labor Code Section 1735, no discrimination shall be made in the employment of persons upon public works on any basis listed in subdivision (a) of section 12940 of the Government Code, as those bases are defined in sections 12926 and 12926.1 of the Government Code, except as otherwise provided in section 12940 of the Government Code. Every Contractor for public works who violates Labor Code Section 1735 is subject to all the penalties imposed for a violation of Division 2, Part 7, Chapter 1 of the Labor Code.

Under 2 California Code of Regulations section 11122:

Standard California Nondiscrimination Construction Contract Specifications (Government Code section 12990)

These specifications are applicable to all Contractors and Subcontractors having a Contract or subcontract of $5,000 or more:

1. As used herein:
   a. "Act" means the Fair Employment and Housing Act.
   b. "Administrator" means Administrator, Office of Compliance Programs, California Department of Fair Employment and Housing, or any person to whom the Administrator delegates authority;
2. Whenever the Contractor or any Subcontractor subcontracts a portion of the work, it shall include in each subcontract of $5,000 or more, the nondiscrimination clause in this Contract directly or through incorporation by reference. Any subcontract for work involving a construction trade shall also include the Standard California Construction Contract Specifications, either directly or through incorporation by reference.
3. The Contractor shall implement the specific nondiscrimination standards provided in paragraph 6(a) through (e) of these specifications.
4. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer members of any group protected by the Act shall excuse the Contractor's obligations under these specifications, Government Code section 12990, or the regulations promulgated pursuant thereto.
5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.
6. The Contractor shall take specific actions to implement its nondiscrimination program. The evaluation of the Contractor's compliance with this specification shall be based upon its effort

to achieve maximum results from its actions. The Contractor must be able to demonstrate fully its efforts under steps (a) through (e) below.

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and at all facilities at which the Contractor's employees are assigned to work. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligations to maintain such a working environment.

b. Provide written notification within seven days to the director of DFEH when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

c. Disseminate the Contractor's equal employment opportunity policy by providing notice of the policy to unions and training, recruitment and outreach programs and requesting their cooperation in assisting the Contractor to meet its obligations; and by posting the company policy on bulletin boards accessible to all employees at each location where construction work is performed.

d. Ensure all personnel making management and employment decisions regarding hiring, assignment, layoff, termination, conditions of work, training, rates of pay or other employment decisions, including all supervisory personnel, superintendents, general foremen, on-site foremen, etc., are aware of the Contractor's equal employment opportunity policy and obligations, and discharge their responsibilities accordingly.

e. Ensure that seniority practices, job classifications, work assignments, and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the equal employment opportunity policy and the Contractor's obligations under these specifications are being carried out.

7. Contractors are encouraged to participate in voluntary associations that assist in fulfilling their equal employment opportunity obligations. The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the equal employment opportunity in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's workforce participation, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor’s.

8. The Contractor is required to provide equal employment opportunities persons. Consequently, the Contractor may be in violation of the Fair Employment and Housing Act (Government Code section 12900 et seq.) if a particular group is employed in a substantially disparate manner.

9. The Contractor shall not use the nondiscrimination standards to discriminate against any person because race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status.

10. The Contractor shall not enter into any subcontract with any person or firm decertified from state contracts pursuant to Government Code section 12990.
11. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the nondiscrimination clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Government Code section 12990 and its implementing regulations by the awarding agency. Any contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Government Code section 12990.
12. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company equal employment opportunity policy is being carried out, to submit reports relating to the provisions hereof as may be required by OCP and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, status, (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in any easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

7-1.02I(3) Underground Utilities and other Subsurface Installations

Underground utilities and subsurface installation are addressed in the Government Code section 4215 and 4216 et seq. Compliance with Government Code section 4216 et seq. is the responsibility of the Contractor and the utility operator of the subsurface installation. The County is not responsible for any costs or damages incurred by the Contractor resulting from any noncompliance with Government Code sections 4216 et seq.

The County shall only be responsible for utility conflicts to the extent required by Government Code section 4215, and only when the conflict involves an existing main trunkline or utility facility.

7-1.02J RESERVED

7-1.02K LABOR CODE

7-1.02K(1) General

Work on the job site must comply with Labor Code §1720 et seq. and 8 California Code of Regulations § 16000 et seq. Work includes roadside production and processing of materials, and hauling and delivery of ready-mixed concrete.

Payroll records include time cards, cancelled checks, cash receipts, trust fund forms, books, documents, schedules, forms, reports, receipts or other information which reflect job assignments, work schedules by days and hours, and the disbursement of payment to workers (8 California Code of Regulations § 16000).

7-1.02K(2) WAGES

The County obtains the general prevailing rate of wages applicable to the work to be done. The rate includes:

1. Basic hourly rate
2. Employer payments for health and welfare, pension, vacation, apprenticeship training fees, travel time, and subsistence pay as provided for in Labor Code § 1773.1

3. Similar purposes

The general prevailing wage rates and any applicable changes to these wage rates are available from the Department of Industrial Relations' website.

Post the general prevailing wage rates at a prominent place at the job site (Labor Code § 1773.2).

The wage determinations refer to expiration dates. The determinations with a single asterisk after the expiration date, and in effect on the date of advertisement for bids, are good for the life of the Contract. The determinations with double asterisks after the expiration date indicate the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, pay the new rate and incorporate it into the Contract. Changes in general prevailing wage determinations apply to the Contract when the Director of Industrial Relations has issued them at least 10 days before advertisement. (Labor Code § 1773.6 and 8 California Code of Regulations 16204).

The County does not recognize any claim for additional payment because of a payment by the Contractor of any wage rate in excess of the prevailing wage rate specified in the Contract.

The Contractor and any Subcontractor must forfeit to the County not more than $200 per day or part of a day for each worker paid less than the prevailing wage rate and pay the worker the difference between the prevailing wage rate and the rate paid (Labor Code § 1775). The Labor Commissioner determines the amount of this penalty and bases the amount on:

1. Whether the failure to pay the correct prevailing wage rate was a good-faith mistake that the Contractor or Subcontractor promptly and voluntarily corrected upon notice.
2. Prior record of the Contractor or Subcontractor in meeting its prevailing wage obligations.
3. Contractor or Subcontractor's willful failure to pay the correct rate of prevailing wages.

If a worker employed by a Subcontractor on a public works project is not paid the general prevailing per diem wages by the Subcontractor, the Contractor is not liable for the penalties described in section 7-1.02K(2) unless the Contractor had knowledge of the failure to pay the correct general prevailing per diem wages or unless the Contractor fails to comply with the following requirements (Labor Code § 1775):

1. The contract executed between the Contractor and the Subcontractor for the performance of work on the public works project must include a copy of the requirements in Labor Code §§ 1771, 1775, 1776, 1777.5, 1813, and 1815.
2. The Contractor must monitor the payment of the specified general prevailing rate of per diem wages by periodic review of the certified payroll records of the Subcontractor.
3. Upon becoming aware of the Subcontractor's failure to pay the specified prevailing rate of wages to the Subcontractor's workers, the Contractor must diligently take corrective action to stop or rectify the failure, including withholding sufficient funds due the Subcontractor for work performed on the public works project.
4. Before making final payment to the Subcontractor for work performed on the public works project, the Contractor must obtain an affidavit signed under penalty of perjury from the Subcontractor that the Subcontractor has paid the specified general prevailing rate of per diem wages to its employees on the public works project and any amounts due under Labor Code § 1813.

Under Labor Code § 1775, the County must notify the Contractor on a public works project within 15 days of receipt by the County of a complaint of the failure of a Subcontractor on that public works project to pay workers the general prevailing rate of per diem wages.

7-1.02K(3) CERTIFIED PAYROLL RECORDS (LABOR CODE § 1776)

Keep accurate payroll records.

Submit a copy of your certified payroll records, weekly, including those of Subcontractors. Include:

1. Each employee's:
   - 1.1. Full name
   - 1.2. Address
   - 1.3. Last four digits of social security number pursuant to Labor Code section 226(a)
   - 1.4. Work classification
   - 1.5. Straight time and overtime hours worked each day and week
   - 1.6. Actual wages paid for each day to each:
     - 1.6.1. Journeyman
     - 1.6.2. Apprentice
     - 1.6.3. Worker
     - 1.6.4. Other employee you employ for the work
   - 1.7. Pay rate
   - 1.8. Itemized deductions made
   - 1.9. Check number issued
2. Apprentices and the apprentice-to-journeyman ratio

Each certified payroll record must include a *Statement of Compliance* signed under penalty of perjury that declares:

1. Information contained in the payroll record is true, correct, and complete
2. Employer has complied with the requirements of sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project
3. Wage rates paid are at least those required by the Contract

The County allows the use of a form with identical wording as the *Statement of Compliance* form provided by the County.

Submitted certified payrolls for hauling and delivering ready-mixed concrete must be accompanied by a written time record. The time record must include:

1. Truck driver's full name and address
2. Name and address of the factory or batching plant
3. Time the concrete was loaded at the factory or batching plant
4. Time the truck returned to the factory or batching plant
5. Truck driver's signature certifying under penalty of perjury that the information contained in this written time record is true and correct.

Make certified payroll records available for inspection at all reasonable hours at your main office on the following basis:

1. Upon the employee's request or upon request of the employee's authorized representative, make available for inspection a certified copy of the employee's payroll record.

2. Refer the public's requests for certified payroll records to the County. Upon the public's request, the County makes available for inspection or furnishes copies of your certified payroll records. Do not give the public access to the records at your main office.

Make all payroll records, including employee's complete social security number, available for inspection and copying or furnish a copy upon request of a representative of the:

1. County
2. Division of Labor Standards Enforcement of the Department of Industrial Relations
3. Division of Apprenticeship Standards of the Department of Industrial Relations

Furnish the County the location of the records. Include the street address, city, and county. Furnish the County a notification of a location and address change within 5 business days of the change.

Comply with a request for the records within 10 days after you receive a written request. If you do not comply within this period, the County withholds from progress payments a $25 penalty for each day or part of a day for each worker until you comply. You are not assessed this penalty for a Subcontractor's failure to comply with Labor Code § 1776.

The County withholds from progress payments for delinquent or inadequate records (Labor Code § 1771.5). If you have not submitted an adequate record by the month's 15th day for the period ending on or before the 1st of that month, the County withholds up to 10 percent of the monthly progress estimate, exclusive of mobilization. The County does not withhold more than $10,000 or less than $1,000.

7-1.02K(4) APPRENTICES

Comply with the apprentice to journeyman ratio requirements (Labor Code § 1777.5(g)).

Comply with the training contribution requirements (Labor Code § 1777.5(m)(1)).

For answers to questions, contact the Division of Apprenticeship Standards before starting work.

The County deducts from progress payments civil penalties assessed by the Chief of the Division of Apprenticeship Standards for violating Labor Code § 1777.5 (Labor Code § 1777.7).

7-1.02K(5) WORKING HOURS

Eight hours is a legal day's work (Labor Code § 1810).

The time of service of any worker employed on public work is limited and restricted to 8 hours in 1 day and 40 hours in 1 calendar week, except as provided by Labor Code § 1815 (Labor Code § 1811).

A Contractor's employee may work more than 8 hours per day and 40 hours per week if the Contractor pays the employee 1-1/2 times the basic pay rate for the hours worked in excess of 8 hours per day and 40 hours per week (Labor Code § 1815).

For each worker employed in the work for each day the worker works more than 8 hours in 1 day and 40 hours in 1 calendar week without overtime pay, the County deducts $25 as a penalty for violating Labor Code § 1815 (Labor Code § 1813).

7-1.02K(6) OCCUPATIONAL SAFETY AND HEALTH STANDARDS

7-1.02K(6)(a) General

Comply with applicable occupational safety and health standards, rules, regulations, and orders. The Occupational Safety and Health Standards Board is the only agency authorized in the State to adopt and enforce occupational safety and health standards (Labor Code § 142 et seq.).

You must contact the local public health service department for information concerning public health conditions within the area of the project.

You are the controlling employer and must ensure hazardous conditions are corrected (Labor Code § 6400).

The Engineer may notify Cal/OSHA if you fail to establish or maintain a safe and healthful workplace.

Submit copies of your Injury and Illness Prevention Program and permits required by Cal/OSHA as informational submittals.

The County is not responsible for the health and safety of:

1. Contractor's personnel
2. Subcontractor's personnel
3. Supplier's personnel
4. Any other persons present at the job site at the request of you or your subcontractors.

7-1.02K(6)(b) Excavation Safety

Section 7-1.02K(6)(b) applies if a bid item for excavation safety is shown on the Bid Item List.

Comply with Labor Code § 6705 while excavating. For any trench or trenches 5 feet or more in depth, submit shop drawings for a protective system. The Engineer is authorized to receive and accept the plans required under Labor Code Section 6705, and to take any other actions regarding said plans that are expressly or implicitly authorized under said statute.

The shop drawings must show the design and details shoring, bracing, sloping, or other provisions for providing worker protection from the hazard of caving ground during trench excavation.

Shop drawings of protective systems for which the Construction Safety Orders require design by a registered professional engineer must be sealed and signed by an engineer who is registered as a civil engineer in the state.

Nothing in this section shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders.

The submittal must allow review time and include the contents shown in the following table except the review time is 65 days for an excavation on or affecting railroad property:

Drawing Review Time and Contents

Topic	Plan not requiring a signature	Plan requiring a signature
Review time	5 business days before excavating	20 days before excavating
Contents	Drawings Calculations Material information Proprietary system information	Drawings Calculations Material information Proprietary system information Soil classification Soil properties Soil design calculations

7-1.02K(6)(c) Tunnel Safety

Cal/OSHA classifies tunnels into one of the following classifications:

1. Nongassy
2. Potentially gassy
3. Gassy
4. Extrahazardous

If a tunnel location is described in the Contract, the classification is included in the Supplemental Project Information and you must:

1. Designate an on-site Safety Representative under 8 California Code of Regulations § 8406
2. Submit the name of your on-site Safety Representative at least 7 days before starting work at each tunnel
3. Prominently post a notice at the job site of:
   3.1. Tunnel classifications
   3.2. Any special orders, rules, special conditions, or regulations related to tunnel work
4. Ensure your workers are informed of these classifications

Notify the Engineer at least 20 days before a worker enters a tunnel not described in the Contract. The County obtains the classification of the tunnel. The Engineer may suspend the work because of a change directly resulting from the Contractor's planned activities that causes activities to fall under the Tunnel Safety Orders of 8 California Code of Regulations § 8422.

7-1.02K(6)(d) Confined Space Safety

Comply with 8 California Code of Regulations § 5158 while working in a confined space.

7-1.02K(6)(e) Scaffolding

Reserved

7-1.02K(6)f)–7-1.02K(6)(i) Reserved

7-1.02K(6)(j) Lead Safety

7-1.02K(6)(j)(i) General

Reserved

7-1.02K(6)(j)(ii) Lead Compliance Plan

Section 7-1.02K(6)(j)(ii) applies if a bid item for a lead compliance plan is shown on the Bid Item List.

Regulations containing specific Cal/OSHA requirements when working with lead include 8 California Code of Regulations § 1532.1.

Submit a plan:

1. That documents your compliance program to prevent or minimize worker exposure to lead
2. Including the items listed in 8 California Code of Regulations § 1532.1(e)(2)(B)
3. Signed and sealed by a CIH

Allow 7 days for review. Obtain authorization for the plan before starting any activity that presents the potential for lead exposure.

Before starting any activity that presents the potential for lead exposure to employees who have no prior training, including County employees, provide a safety training program to these employees that complies with 8 California Code of Regulations § 1532.1 and your lead compliance plan.

Submit copies of air monitoring or job site inspection reports made by or under the direction of the CIH under 8 California Code of Regulations § 1532.1 within 10 days after the date of monitoring or inspection.

Supply personal protective equipment, training, and washing facilities required by your lead compliance plan for 5 County employees.

7-1.02K(6)(j)(iii) Unregulated Earth Material Containing Lead

Reserved

7-1.02K(6)(k)–7-1.02K(6)(t) Reserved

7-1.02K(7) California Department of Industrial Relations – Public Works Contractor Registration

1. Beginning July 1, 2014, under the Public Works Contractor Registration Law (California Senate Bill No. 854 – See Labor Code Section 1725.5), contractors must register and meet requirements using the online application before bidding on public works contracts in California. The application also provides agencies that administer public works programs with a searchable database of qualified contractors. Application and renewal are completed online with a non-refundable fee of $300. More information is available at the following links:

   https://www.dir.ca.gov/public-works/PublicWorksSB854.html

   http://www.dir.ca.gov/Public-Works/PublicWorks.html

2. Beginning April 1, 2015, the County must award public works projects only to Contractors and Subcontractors who comply with the Public Works Contractor Registration Law.

3. Notice to Bidders and Subcontractors:

    a. A Contractor or Subcontractor shall not be qualified to bid on, be listed in the *Designation of Subcontractors* form (subject to the requirements of Section 4104 of the Public Contract Code), or engage in the performance of this public works project, unless currently registered with the Department of Industrial Relations and qualified to perform work pursuant to Labor Code section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the Contractor is registered to perform public work pursuant to Section 1725.5 at the time the Contract is awarded

    b. No Contractor or Subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

    c. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

    d. The Contractor must post job site notices prescribed by regulation. (See 8 California Code of Regulations Section 16451(d) for the notice that previously was required for projects monitored by the DIR Compliance Monitoring Unit.)

4. Furnishing of Electronic Certified Payroll Records to Labor Commissioner. For all new projects awarded on or after April 1, 2015, Contractors and Subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).

7-1.02L PUBLIC CONTRACT CODE

7-1.02L(1) General

Reserved

7-1.02L(2) Antitrust Claims

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with § 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties. [Public Contract Code § 7103.5 (b)]

7-1.02L(3) Iran Contracting Act of 2010

Pursuant to the Iran Contracting Act of 2010 (Public Contract Code §§ 2200-2208, "the Act"), bidders are ineligible to bid on, submit a proposal for, enter into, or renew any contract with the County for goods or services of one million dollars ($1,000,000) or more if the bidder engages in investment activities in Iran, as defined in the Act. The Act requires that the California Department of General Services (DGS) establish and periodically update a list of ineligible vendors.

Also, pursuant to the Act, financial institutions are ineligible to bid on, submit a proposal for, enter into, or renew any contract with the County for goods or services of one million dollars ($1,000,000) or more if the financial institution extends credit, as defined in the Act, to a business identified on the DGS list of ineligible vendors that will use the credit to provide goods or services in the energy sector in Iran.

Prior to submitting a bid or proposal and prior to executing any County contract or renewal for goods or services of one million dollars ($1,000,000) or more, a bidder must certify that it is not on the list of ineligible bidders prohibited from doing business with the County. During the bid evaluation, the County shall check the list of ineligible vendors to confirm that the bidder is not on that list.

Financial institutions must also certify that they are not extending credit to an ineligible vendor as described in the Act. This certification requirement applies regardless of the procurement approach, method, or solicitation format used, including, but not limited to: Request for Proposals, Invitation for Bids, and non-competitive awards.

The Act provides exceptions to the certification requirement (see Public Contract Code §§ 2203(c) and (d)).

Any questions regarding the Iran Contracting Act of 2010 may be directed to the State of California, Department of General Services, Office of Policies, Procedures, and Legislation (OPPL) at PPO@dgs.ca.gov. For more information, the webpage for the OPPL is located at https://www.dgs.ca.gov/PD/About/Page-Content/PD-Branch-Intro-Accordion-List/Policy-Training-and-Customer-Service/Office-of-Policies-Procedures-and-Legislation.

7-1.02L(4) Public Contract Code Section 9204

Public Contract Code Section 9204 states the following:

(a) The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

(b) Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

(c) For purposes of this section:

(1) “Claim” means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.

(B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.

(C) Payment of an amount that is disputed by the public entity.

(2) “Contractor” means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.

(3) (A) “Public entity” means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.

(B) “Public entity” shall not include the following:

(i) The Department of Water Resources as to any project under the jurisdiction of that department.

(ii) The Department of Transportation as to any project under the jurisdiction of that department.

(iii) The Department of Parks and Recreation as to any project under the jurisdiction of that department.

(iv) The Department of Corrections and Rehabilitation with respect to any project under its jurisdiction pursuant to Chapter 11 (commencing with Section 7000) of Title 7 of Part 3 of the Penal Code.

(v) The Military Department as to any project under the jurisdiction of that department.

(vi) The Department of General Services as to all other projects.

(vii) The High-Speed Rail Authority.

(4) “Public works project” means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.

(5) “Subcontractor” means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

(d) (1) (A) Upon receipt of a claim pursuant to this section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.

(B) The claimant shall furnish reasonable documentation to support the claim.

(C) If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.

(D) Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.

(2) (A) If the claimant disputes the public entity's written response, or if the public entity fails to respond to a claim issued pursuant to this section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(B) Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

(C) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

(D) Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

(E) This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.

(3) Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

(4) Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

(5) If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may

request in writing, either on their own behalf or on behalf of a lower tier subcontractor, that the contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the public entity shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the contractor shall notify the subcontractor in writing as to whether the contractor presented the claim to the public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

(e) The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

(f) A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

(g) This section applies to contracts entered into on or after January 1, 2017.

(h) Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

(i) This section shall remain in effect only until January 1, 2027, and as of that date is repealed, unless a later enacted statute that is enacted before January 1, 2027, deletes or extends that date.

7-1.02L(5) Public Contract Code Sections 20104 – 20104.6

20104.

(a) (1) This article applies to all public works claims of three hundred seventy-five thousand dollars ($375,000) or less which arise between a contractor and a local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.

(b) (1) "Public work" means "public works contract" as defined in Section 1101 but does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

20104.2.

For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b) (1) For claims of less than fifty thousand dollars ($50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c) (1) For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1

(commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

20104.4.

The following procedures are established for all civil actions filed to resolve claims subject to this article:

(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

(b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act (Title 4 (commencing with Section 2016.010) of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

20104.6.

(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

7-1.02M PUBLIC RESOURCES CODE

7-1.02M(1) General

Reserved

7-1.02M(2) Fire Protection

Submit the names and emergency telephone numbers of the nearest fire suppression agencies before the start of job site activities as an informational submittal. Post the names and phone numbers at a prominent place at the job site.

Submit a copy of your fire prevention plan required by Cal/OSHA as an informational submittal before the start of job site activities.

Cooperate with fire prevention authorities in performance of the work.

Immediately report fires occurring within and near the project limits by dialing 911 and to the nearest fire suppression agency by using the emergency phone numbers retained at the job site.

Prevent project personnel from setting open fires that are not part of the work.

Prevent the escape of and extinguish fires caused directly or indirectly by job site activities.

7-1.02M(3) Surface Mining and Reclamation Act

Imported borrow or aggregate material must come from a surface mine permitted under the Surface Mining and Reclamation Act of 1975, Pub Resource Code § 2710 et seq., or from a source not subject to this act.

For the list of permitted sites, go to the Department of Conservation, Office of Mine Reclamation website:

https://www.conservation.ca.gov/dmr

If you import borrow or aggregate material from a surface mine not on this list, submit proof that the source is not subject to this act.

7-1.02M(4)–7-1.02M(7) Reserved

7-1.02N RESERVED

7-1.02O VEHICLE CODE

Under Vehicle Code § 591, the County determines areas within the project limits are open to public traffic. For those areas, comply with the requirements set forth in Divisions 11, 12, 13, 14, and 15 of the Vehicle Code.

Vehicle Code § 591 does not relieve you or any other person from the duty of exercising due care.

Under Vehicle Code § 23114, all trucks hauling dirt, sand, soil, or other loose materials must be covered or must maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer).

7-1.02P–7-1.02Z RESERVED

7-1.03 PUBLIC CONVENIENCE

Compliance with section 7-1.03 does not relieve you of your responsibility for public safety.

Construction activities must not inconvenience the public or abutting property owners. Schedule and conduct work to avoid unnecessary inconvenience to the public and abutting property owners. Avoid undue delay in construction activities to reduce the public's exposure to construction.

Where possible, route traffic on new or existing paved surfaces.

County lane and road closures shall comply with the most recent edition of the County of San Luis Obispo Public Improvement Standards "County Lane and Road Closure Restriction List" and applicable notes.

Maintain convenient access to driveways, houses, and buildings. When an abutting property owner's access across the right-of-way line is to be eliminated or replaced under the Contract, the existing access must not be closed until the replacement access facility is usable. Construct temporary approaches to a crossing and an intersecting highway.

Provide a reasonably smooth and even surface for use by traffic at all time during the excavation of a roadway and construction of an embankment. Before other grading activities, place fill at culverts and bridges to allow traffic to cross. If ordered, excavate a roadway cut in layers and construct an embankment in partial widths at a time alternating construction from one side to the other and routing traffic over the side opposite the one under construction. Install or construct culverts on only 1/2 the width of the traveled way at a time; keep the traveled way portion being used by traffic open and unobstructed until the opposite side of the traveled way is ready for use by traffic.

Upon completion of rough grading or placing any subsequent layer, bring the surface of the roadbed to a smooth and even condition, free of humps and depressions, and satisfactory for the use of the public.

After subgrade preparation for a specified layer of material has been completed, repair any damage to the roadbed or completed subgrade, including damage caused by public use.

While subgrade and paving activities are underway, allow the public to use the shoulders. If half-width paving methods are used, allow the public to use the side of the roadbed opposite the one under construction. If enough width is available, keep open a passageway wide enough to accommodate at least 2 lanes of traffic at locations where subgrade and paving activities are underway. Shape shoulders or reshape subgrade as necessary to accommodate traffic during subgrade preparation and paving activities.

Apply a dust palliative for the prevention or alleviation of dust nuisance.

Grind existing surfaces to accommodate a minimum taper thickness of 0.10 foot under either of the following conditions:

1. HMA material such as rubberized HMA, polymer-modified bonded wearing course, or open-graded friction course is unsuitable for raking to a maximum 0.02-foot thickness at the edge
2. Taper will be in place for more than 14 days

For a taper on a bridge deck or approach slab, construct the taper with rapid setting concrete under section 60-3.04B.

The completed surface of the taper must be uniform and must not vary more than 0.02 foot from the lower edge of a 12-foot straightedge when placed on its surface parallel and perpendicular to traffic.

If authorized, you may use alternative materials or methods to construct the required taper.

Install signs, lights, flares, Type K temporary railing, barricades and other facilities to direct traffic. Provide flaggers whenever necessary to direct the movement of the public through or around

the work. Flagging must comply with section 12-1. The County pays you for this work under section 12-1.04.

You are required to pay for the cost of replacing or repairing all facilities installed under change order work for the convenience, direction, or warning of the public that are lost while in your custody or are damaged by your operations to such an extent as to require replacement or repair.

The Engineer may order or consent to your request to open a completed section of surfacing, pavement, or structure roadway surface for public use. You will not be compensated for any delay to your construction activities caused by the public. This does not relieve you from any other contractual responsibility.

7-1.04 PUBLIC SAFETY

You are responsible to provide for public safety.

Do not construct a temporary facility that interferes with the safe passage of traffic.

Control dust resulting from the work, inside and outside the right-of-way.

Move workers, equipment, and materials without endangering traffic.

Whenever your operations create a condition hazardous to the public, furnish, erect and maintain those fences, temporary railing, barricades, lights, signs, and other devices and take any other necessary protective measures to prevent damage or injury to the public.

Any fences, temporary railing, barricades, lights, signs, or other devices furnished, erected and maintained by you are in addition to those for which payment is provided elsewhere in the specifications.

Provide flaggers whenever necessary to ensure that the public is given safe guidance through the work zone. Flagging must comply with section 12-1. The County pays you for this work under section 12-1.04.

At locations where traffic is being routed through construction under one-way controls, move your equipment in compliance with the one-way controls unless otherwise ordered.

Use of signs, lights, flags, or other protective devices must comply with the *California MUTCD* and any directions of the Engineer. Signs, lights, flags or other protective devices must not obscure the visibility of, nor conflict in intent, meaning, and function of either existing signs, lights and traffic control devices, or any construction area signs.

Keep existing traffic signals and highway lighting in operation. Other forces within the County will perform routine maintenance of these facilities during the work.

Cover signs that direct traffic to a closed area. Except for work specified in section 12, maintaining, and removing the covers on construction area signs is change order work.

Install temporary illumination such that the illumination and the illumination equipment do not interfere with public safety. The installation of general roadway illumination does not relieve you from furnishing and maintaining any protective devices.

Equipment must enter and leave the highway via existing ramps and crossovers and must move in the direction of traffic. All movements of workmen and construction equipment on or across lanes open to traffic must be performed in a manner that do not endanger the public. Your vehicles or other mobile equipment leaving an open traffic lane to enter the construction area

must slow down gradually in advance of the location of the turnoff to give the traffic following an opportunity to slow down. When leaving a work area and entering a roadway carrying traffic, your vehicles and equipment must yield to traffic.

Immediately remove hauling spillage from a roadway lane or shoulder open to traffic. When hauling on roadways, trim loads and remove material from shelf areas to minimize spillage.

Notify the Engineer not less than 25 days and not more than 125 days before the anticipated start of an activity that will change the vertical or horizontal clearance available to traffic, including shoulders.

If vertical clearance is temporarily reduced to 15.5 feet or less, place low clearance warning signs in compliance with the *California MUTCD* and any directions of the Engineer. Signs must comply with the dimensions, color, and legend requirements of the *California MUTCD* and section 12-3.06 except that the signs must have black letters and numbers on an orange retroreflective background. W12-2P signs must be illuminated so that the signs are clearly visible.

Pave or provide full width continuous and cleared wood walks for pedestrian openings through falsework. Protect pedestrians from falling objects and concrete-curing water. Extend overhead protection for pedestrians at least 4 feet beyond the edge of the bridge deck. Illuminate all pedestrian openings through falsework. Temporary pedestrian facilities must comply with the *California MUTCD*, Part 6, Chapter 6D, "Pedestrian and Worker Safety."

Do not store vehicles, material, or equipment in a way that:

1. Creates a hazard to the public
2. Obstructs traffic control devices

Do not install or place temporary facilities used to perform the work which interfere with the free and safe passage of traffic.

Temporary facilities that could be a hazard to public safety if improperly designed must comply with design requirements described in the Contract for those facilities or, if none are described, with standard design criteria or codes appropriate for the facility involved. Submit shop drawings and design calculations for the temporary facilities and show the standard design criteria or codes used. Shop drawings and supplemental calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

If you appear to be neglectful or negligent in furnishing warning devices and taking protective measures, the Engineer may direct your attention to the existence of a hazard. You must furnish and install the necessary warning devices. If the Engineer points out the inadequacy of warning devices and protective measures, that action on the part of the Engineer does not relieve you from your responsibility for public safety or abrogate your obligation to furnish and pay for these devices and measures.

Install Type K temporary railing or other authorized protective systems under any of the following conditions:

1. Excavations: Where the near edge of the excavation is within 15 feet from the edge of an open traffic lane
2. Temporarily unprotected permanent obstacles: When the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and you elect to install the obstacle before installing the protective system;

or you, for your convenience and as authorized, remove a portion of an existing protective railing at an obstacle and do not replace such railing completely the same day

3. Storage areas: When material or equipment is stored within 15 feet of the edge of an open traffic lane and the storage is not otherwise prohibited by the Contract
4. Height differentials: When construction operations create a height differential greater than 0.15 feet within 15 feet of the edge of traffic lane

Installation of Type K temporary railing is not required if an excavation within 15 feet from the edge of an open traffic lane is protected by any of the following:

1. Steel plate or concrete covers of adequate thickness to prevent accidental entry by traffic or the public
2. Side slope where the downhill slope is 4:1 (horizontal:vertical) or less unless a naturally occurring condition
3. Barrier or railing

Offset the approach end of Type K temporary railing a minimum of 15 feet from the edge of an open traffic lane. Install the temporary railing on a skew toward the edge of the traffic lane of not more than 1 foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing must be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules must be installed at the approach end of the temporary railing.

Secure Type K temporary railing in place before starting work for which the temporary railing is required.

Where 2 or more lanes in the same direction are adjacent to the area where the work is being performed, including shoulders, the adjacent lane must be closed under any of the following conditions:

1. Work is off the traveled way but within 6 feet of the edge of the traveled way, and the approach speed is greater than 45 miles per hour
2. Work is off the traveled way but within 3 feet of the edge of the traveled way, and the approach speed is less than 45 miles per hour

Closure of the adjacent traffic lane is not required when performing any of the following:

1. Working behind a barrier
2. Paving, grinding, or grooving
3. Installing, maintaining, or removing traffic control devices except Type K temporary railing

Do not reduce an open traffic lane width to less than 10 feet. When traffic cones or delineators are used for temporary edge delineation, the side of the base of the cones or delineators nearest to traffic is considered the edge of the traveled way.

If a traffic lane is closed with channelizers for excavation work, move the devices to the adjacent edge of the traveled way when not excavating. Space the devices as specified for the lane closure.

Do not move or temporarily suspend anything over a traffic lane open to the public unless the public is protected.

7-1.05 INDEMNIFICATION

7-1.05A Indemnification of County

7-1.05A(1) General

To the fullest extent permitted by law, and in accordance with California Civil Code § 2782, Contractor shall indemnify, defend (with counsel reasonably approved by the County), and hold harmless the County, their officials, officers, agents, employees, and volunteers ("Indemnitees") from and against any and all claims, demands, damages, liabilities, loss, costs and expenses (including attorney's fees and costs of litigation), of every nature arising out of the performance or nonperformance of the work described herein, caused in whole or in part by any act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, except where caused by the sole negligence or willful misconduct of the County ("Indemnity Claims").

7-1.05A(2) Reserved

7-1.05A(3) Independent Defense Obligation

The duty of the Contractor to indemnify and hold harmless the Indemnitees includes the separate and independent duty to defend the Indemnitees, which duty arises immediately upon receipt by Contractor of the tender of any Indemnity Claim from an Indemnitee. The Contractor's obligation to defend the Indemnitee(s) shall be at Contractor's sole expense, and not be excused because of the Contractor's inability to evaluate liability or because the Contractor evaluates liability and determines that the Contractor is not liable. This duty to defend shall apply whether or not an Indemnity Claim has merit or is meritless, or which involves claims or allegations that any or all of the Indemnitees were actively, passively, or concurrently negligent, or which otherwise asserts that the Indemnitees are responsible, in whole or in part, for any Indemnity Claim. The Contractor shall respond within 30 days to the tender of any Indemnity Claim for defense and/or indemnity by an Indemnitee, unless the Indemnitee agrees in writing to an extension of this time. The defense provided to the Indemnitees by Contractor shall be by well qualified, adequately insured and experienced legal counsel acceptable to the County. Contractor shall not settle any action, suit, or proceeding in any manner that would impose any obligation or restriction on an Indemnitee or require an Indemnitee to admit liability or wrongdoing without Indemnitee's prior written consent, which shall not be unreasonably withheld.

7-1.05A(4) Intent of Parties Regarding Scope of Indemnity

It is the intent of the parties that the Contractor and its Subcontractors of all tiers shall provide the Indemnitees with the broadest defense and indemnity permitted by Applicable Law. In the event that any of the defense, indemnity or hold harmless provisions in the Contract Documents are found to be ambiguous, or in conflict with one another, it is the parties' intent that the broadest and most expansive interpretation in favor of providing defense and/or indemnity to the Indemnitees be given effect.

7-1.05A(5) Waiver of Indemnity Right Against Indemnitees

With respect to third party claims against the Contractor, to the fullest extent permitted by law, the Contractor waives any and all rights to any type of express or implied indemnity against the Indemnitees.

7-1.05A(6) Subcontractor Requirements

In addition to the requirements set forth hereinabove, Contractor shall ensure, by written subcontract agreement, that each of Contractor's Subcontractors of every tier shall protect, defend, indemnify and hold harmless the Indemnitees with respect to Indemnity Claims arising out of, in connection with, or in any way related to each such Subcontractors' work on the Project in the same manner in which Contractor is required to protect, defend, indemnify and hold the Indemnitees harmless. In the event Contractor fails to obtain such defense and indemnity obligations from others as required herein, Contractor agrees to be fully responsible to the Indemnitees according to the terms of this section 7-1.05A.

7-1.05A(7) No Limitation or Waiver of Rights

Contractor's obligations under this section 7-1.05A are in addition to any other rights or remedies which the Indemnitees may have under the law or under the Contract Documents. Contractor's indemnification and defense obligations set forth in this section 7-1.05A are separate and independent from the insurance provisions set forth in the Contract Documents, and do not limit, in any way, the applicability, scope, or obligations set forth in such insurance provisions. The purchase of insurance by the Contractor with respect to the obligations required herein shall in no event be construed as fulfillment or discharge of such obligations. In any and all claims against the Indemnitees by any employee of the Contractor, any Subcontractor, any supplier of the Contractor or Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the obligations under this section 7-1.05A shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor or any supplier of either of them, under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. Failure of the County to monitor compliance with these requirements imposes no additional obligations on the County and will in no way act as a waiver of any rights hereunder.

7-1.05A(8) Withholding to Secure Obligation

In the event an Indemnity Claim arises prior to final payment to Contractor, the County may, in its sole discretion, reserve, deduct, retain or apply any monies due Contractor for the purpose of resolving such Indemnity Claims; provided, however, the County may release such funds if the Contractor provides the County with reasonable assurances of protection of the Indemnitees' interests. The County shall, in its sole discretion, determine whether such assurances are reasonable.

7-1.05A(9) Survival of Indemnity Obligations

Contractor's obligations under this section 7-1.05A are binding on Contractor's and its Subcontractors' successors, heirs and assigns and shall survive the completion of the work or termination of the Contractor's performance of the work.

7-1.05B RESPONSIBILITY TO OTHER ENTITIES

You are responsible for any liability imposed by law and for injuries to or death of any person, including workers and the public, or damage to property. Indemnify and save harmless any county, city or district and its officers and employees connected with the work, within the limits of which county, city, or district the work is being performed, all in the same manner and to the same extent specified for the protection of the County.

7-1.05C OTHER

You are responsible to the fullest extent allowed by law, to defend and indemnify the County for any and all injury, illness, disease, or death arising out of or caused by an organism, including but not limited to animals, microscopic bacteria, fungi, plants and the like, to which persons, including but not limited to the public, any employees or agents of yours, the County or any other contractors that are exposed in connection with the work on the project.

7-1.06 INSURANCE

7-1.06A GENERAL

Contractor shall procure and maintain for the duration of the contract, and for 5 years thereafter, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, employees, or Subcontractors.

7-1.06B MINIMUM SCOPE AND LIMIT OF INSURANCE

Coverage shall be at least as broad as:

1. Commercial General Liability: Insurance Services Office Form CG 00 01, including products and completed operations, with limits of no less than **$5,000,000** per occurrence for bodily injury, personal injury, and property damage. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: Insurance Services Office Form Number CA 0001 covering Code 1 (any auto), with limits no less than **$1,000,000** per accident for bodily injury and property damage.
3. Workers' Compensation insurance as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than **$1,000,000** per accident for bodily injury or disease.
4. Builder’s Risk (Course of Construction) insurance covering All Risks (Special Perils) coverage form, with limits equal to the complete value of the project and no coinsurance penalty provisions.

If Contractor maintains broader coverage and/or higher limits than the minimums shown above, the County shall be entitled to the broader coverage and/or the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the County.

The Contractor may use Umbrella or Excess policies to provide the liability limits as required in this Agreement. The form of insurance will be acceptable provided that all of the Primary and Umbrella or Excess Policies shall provide all of the insurance coverages herein required, including, but not limited to, primary and non-contributory, additional insured, self-insured retentions (“SIRs”), indemnity, and defense requirements. The Umbrella or Excess policies shall be provided on a true “following form” or broader coverage basis, with coverage at least as broad as provided on the underlying Commercial General Liability insurance. No insurance policies maintained by the additional insureds, whether primary or excess, and which also apply to a loss covered hereunder, shall be called upon to contribute to a loss until the Contractor’s primary and excess liability policies are exhausted.

7-1.06C DEDUCTIBLES AND SELF-INSURANCE RETENTIONS

Any deductibles or self-insured retentions must be declared to and approved by the County. The County may require the Contractor to provide proof of ability to pay losses and related investigations, claim administration, and defense expenses within the retention. Any and all deductibles and self-insured retentions shall be the sole responsibility of the Contractor or subcontractor who procured such insurance and shall not apply to the Indemnified Additional Insured parties. The County may deduct from any amounts otherwise due the Contractor to fund the self-insured retentions/deductibles. The policy must also provide that defense costs, including the allocated loss adjustment expenses, will satisfy the self-insured retentions or deductibles.

7-1.06D OTHER INSURANCE PROVISIONS

The insurance policies are to contain, or be endorsed to contain, the following provisions:

1. The County, its officers, officials, employees, and volunteers are to be covered as additional insureds on the CGL with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations and automobiles owned, leased, hired, or borrowed on or behalf of the Contractor. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance (at least as broad as ISO Form CG 20 10, CG 11 85 or both CG 20 10 and CG 20 26, CG 20 33, or CG 20 38; and CG 20 37 forms if later revisions used).
2. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the County, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the County, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
3. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be canceled except after 30 days prior written notice (10 days for non-payment) has been provided to the County.

Contractor may submit evidence of Builder’s Risk insurance in the form of Course of Construction coverage. Such coverage shall name the County as a loss payee as their interest may appear.

If the project does not involve new or major reconstruction, at the option of the County, an Installation Floater may be acceptable. For such projects, a Property Installation Floater shall be obtained that provides for the improvement, remodel, modification, alteration, conversion or adjustment to existing buildings, structures, processes, machinery, and equipment. The Property Installation Floater shall provide property damage coverage for any building, structure, machinery, or equipment damaged, impaired, broken, or destroyed during the performance of the work, including during transit, installation, and testing at the County’s site.

7-1.06E ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with a current A.M. Best rating of no less than A: VII, unless otherwise acceptable to the County.

7-1.06F WAIVER OF SUBROGATION

Contractor hereby agrees to waive rights of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Contractor agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the County for all work performed by the Contractor, its employees, agents, and Subcontractors.

7-1.06G VERIFICATION OF COVERAGE

Contractor shall furnish the County with original certificates and amendatory endorsements, or copies of the applicable insurance language, effecting coverage required by this clause and a copy of the Declarations and Endorsements Pages of the CGL and any Excess policies listing all policy endorsements. All certificates and endorsements and copies of the Declarations and Endorsement pages are to be received and approved by the County before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Contractor's obligation to provide them. The County reserves the right to require complete, certified copies of all required insurance policies, including endorsements, required by these specifications, at any time.

Certificates and copies of any required endorsements shall be sent to:

County of San Luis Obispo
Department of Public Works
976 Osos Street, Room 206
San Luis Obispo, CA 93408
Attention: Design Engineer

7-1.06H SUBCONTRACTORS

Contractor shall require and verify that all Subcontractors maintain insurance meeting all the requirements stated herein.

7-1.06I SPECIAL RISKS OR CIRCUMSTANCES

County reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other circumstances.

7-1.07 LEGAL ACTIONS AGAINST THE COUNTY

7-1.07A GENERAL

If legal action is brought against the County over compliance with a State or federal law, rule, or regulation applicable to highway work, then:

1. If the County in complying with a court order prohibits you from performing work, the resulting delay is a suspension related to your performance, unless the County terminates the Contract.
2. If a court order (other than an order to show cause) or the final judgment in the action prohibits the County from requiring you to perform work, the County may delete the prohibited work or terminate the Contract.

If work is prohibited as a result of the Contractor’s failure to comply with the Contract, the County reserves all of its rights and remedies under the Contract and applicable law. Nothing in this section should be construed as authorizing an increase in Contract Price or Contract Time.

7-1.07B SEAL COAT CLAIMS

Pay for claims for personal property damage caused by screening and bituminous binder.

Within 30 days of the last screening spreading, do the following:

1. Process and resolve all claims reported or submitted to you by the public as follows:
   1.1. Within 3 business days of receipt of a claim, submit to the County a copy of the claim, a written analysis of the claim, and a statement indicating whether or not you will pay the claim. If you reject a claim, provide the reasons for rejection in writing.
   1.2. If the claimant becomes dissatisfied with your handling of the claim, immediately refer the claimant to the Engineer for assistance in resolving the claim.
2. Submit to the County evidence of your paid claims.

All third party claims properly presented to the County, under Govt Code § 900 et seq. are processed and resolved by the County as follows:

1. The claims are processed as formal government claims subject to all laws and policies and are resolved as the County determines including referring the claim to you for handling.
2. If the County approves settlement of a claim or is ordered to pay pursuant to a court order, the claim is paid from funds withheld from you.
3. Within 3 business days of the County's determination that you are responsible for resolving the claim, the County sends a copy of the claim to you for resolution or notifies you of the County's decision to resolve the claim.

If no withheld funds remain or have been returned, the County may pay any claims and seek reimbursement from you through an offset or any other legal means.

7-1.08 PERSONAL LIABILITY

Neither the Director, the Engineer, nor any other officer or authorized employee of the County, nor any officer or employee of State, city, or district shall be personally responsible for any liability arising under or by virtue of the Contract.

7-1.09–7-1.10 RESERVED

7-1.11 FEDERAL LAWS

7-1.11A GENERAL

Attention is directed to Required Federal Contract Provisions.

7-1.11B RESERVED

7-1.121C RESERVED

7-1.11D RESERVED

7-1.12 RESERVED

8 PROSECUTION & PROGRESS

8-1.01 GENERAL

Section 8 includes specifications related to prosecuting the Contract and work progress.

Weekly meetings will be held at the job site to review the progress of the work and discuss any problems that may have occurred. Provide an updated schedule at the weekly meeting. The meeting must include, at a minimum:

1. The Engineer
2. Inspectors
3. Your foreman

8-1.02 SCHEDULE

8-1.02A GENERAL

Attention is directed to Section 80 of the FAA General Contract Provisions. All schedules must be consistent in all respects with the time and order of Contract work requirements. Perform work in the sequence indicated on the current accepted schedule.

You are responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

If the Contract includes construction staging and you propose changes to the described staging, do not perform work affected by the proposed changes until the Engineer accepts your schedule. Changes to the schedule that change described staging is Change Order Work.

The Engineer's review and acceptance of schedules does not void any Contract part and does not void your responsibility for submitting complete and accurate information.

Correct rejected schedules and resubmit them within 7 days of notification by the Engineer. Allow 7 days for the Engineer's review of the resubmittal.

Errors or omissions on schedules do not void your responsibility for completing all work within the time specified for completion of the work.

If either you or the Engineer discovers that any aspect of the schedule has an error or omission after a schedule has been accepted, correct it on the next updated schedule.

8-1.02B LEVEL 1 CRITICAL PATH METHOD SCHEDULE

8-1.02B(1) General

Attention is directed to Section SP-100-1.3 of the FAA Special Provisions. Section 8-1.02B applies to a contract with a total Bid less than $1 million and less than 100 original working days.

Before or at the preconstruction conference, submit a CPM baseline schedule.

For each schedule submit:

1. Plotted original, time-scaled network diagram on a sheet at least 8-1/2 by 11 inches with a title block and timeline
2. Read-only compact disc or other Engineer-authorized data-storage device containing the schedule data if software is used to make the schedule. Label the device with:
   2.1. Contract number
   2.2. CPM schedule number and date produced

2.3. File name

8-1.02B(2) Schedule Format

On each schedule, show:

1. Planned and actual start and completion dates of each work activity, including applicable:
   1.1. Submittal development
   1.2. Submittal review and acceptance
   1.3. Material procurement
   1.4. Contract milestones and constraints
   1.5. Equipment and plant setup
   1.6. Interfaces with outside entities
   1.7. Erection and removal of falsework and shoring
   1.8. Test periods
   1.9. Major traffic stage change
   1.10. Final cleanup
2. Order that you propose to prosecute the work
3. Logical links between the time-scaled work activities
4. All controlling activities
5. Legible description of each activity
6. At least 1 predecessor and 1 successor to each activity except for project start and project end milestones
7. Duration of at least 1 working day for each activity
8. Start milestone date as the Contract approval date

8-1.02B(3) Updated Schedule

Submit a monthly updated schedule that includes the status of work completed to date and the work yet to be performed as planned.

You may include changes to updated schedules that do not alter a critical path or extend the scheduled completion date compared to the current schedule. Changes may include:

1. Adding or deleting activities
2. Changing activity constraints
3. Changing durations
4. Changing logic

If any proposed change in planned work would alter the critical path or extend the scheduled completion date, submit a revised schedule within 15 days of the proposed change.

8-1.02C LEVEL 2 CRITICAL PATH METHOD SCHEDULE

8-1.02C(1) General

Section 8-1.02C applies to a contract with (1) a total Bid less than $1 million and 100 or more original working days, (2) a total Bid from $1 to $5 million, or (3) a total Bid over $5 million and less than 100 original working days.

Use computer software to prepare each schedule.

8-1.02C(2) Schedule Format

For the schedule format, comply with the 1st paragraph of section 8-1.02B(2) and show:

1. Calculations using the CPM to determine controlling activities.
2. Duration activities less than 20 working days.
3. Each required constraint. Constraints other than those required by the specifications may be included only if authorized.

8-1.02C(3) Computer Software

8-1.02C(3)(a) General

Submit a description of your proposed schedule software for authorization.

Software must be compatible with the current version of the Microsoft Windows operating system in use by the Engineer.

The schedule software must include the latest version of Primavera P6 for Windows or equal.

Any proposed schedule software equal to Primavera P6 must be capable of:

1. Generating files that can be imported into Primavera P6
2. Comparing 2 schedules and providing reports of changes in activity ID, activity description, constraints, calendar assignments, durations, and logic ties

8-1.02C(3)(b) Reserved

8-1.02C(4) Data and Network Diagrams

For each schedule, submit:

1. 1 data-storage device containing the schedule data
2. 2 sets of originally plotted, time-scaled network diagrams

The data-storage device must comply with item 2 of the 3rd paragraph of section 8-1.02B(1).

The time-scaled network diagrams must:

1. Show a continuous flow of information from left to right
2. Be based on early start and early finish dates of activities
3. Clearly show the primary critical path using graphical presentation
4. Be on 11 by 17 inches or larger sheets
5. Include a title block and a timeline on each page

8-1.02C(5) Baseline Schedule

Submit a baseline schedule and all support data within 20 days of Contract approval. Allow 20 days for review after the submittal.

Starting on the week the baseline schedule is first submitted, meet with the Engineer weekly to discuss and resolve schedule issues until the baseline schedule is accepted.

The baseline schedule must include the entire scope of work and how you plan to complete all work contemplated.

The baseline schedule must show the activities that define the critical path. Multiple critical paths and near-critical paths must be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities must be critical or near critical unless otherwise authorized.

The baseline schedule must not extend beyond the number of original working days.

8-1.02C(6) Updated Schedule

Each updated schedule must comply with section 8-1.02B(3).

Meet with the Engineer to review work progress on or before the 1st day of each month, starting 1 month after the baseline schedule is accepted.

Allow 15 days for review after the updated schedule and all support data are submitted. The review period does not start until the previous month's required schedule is accepted.

Updated schedules not accepted or rejected within the review period are accepted.

The updated schedule must:

1. Have a data date of the 21st day of the month or other date established by the Engineer
2. Show changes from accepted revised schedules

8-1.02C(7) Final Updated Schedule

Submit a final updated as-built schedule with actual start and finish dates for the activities within 30 days after work completion.

Submit a written certificate with this submittal signed by your project manager or an officer of the company stating:

> "To my knowledge and belief, the enclosed final updated schedule reflects the actual start and finish dates of the actual activities for the project contained herein."

An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

8-1.02D LEVEL 3 CRITICAL PATH METHOD SCHEDULE

8-1.02D(1) General

Section 8-1.02D applies to a contract with a total Bid over $5 million and 100 or more original working days.

Comply with section 8-1.02C(1).

8-1.02D(2) Schedule Format

For the schedule format, comply with section 8-1.02C(2) and show:

1. At least 50 but not more than 500 activities unless authorized. The number of activities must be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.
2. County-owned float as the predecessor activity to the scheduled completion date.
3. Activities with identification codes for responsibility, stage, work shifts, location, and bid items.

You may show early completion time on any schedule if you comply with the Contract. Early completion time is a resource for your exclusive use. You may increase early completion time by improving production, reallocating resources to be more efficient, performing sequential activities concurrently, or by completing activities earlier than planned.

You may show a scheduled completion date that is later than the work completion date on an updated schedule after the baseline schedule is accepted. Provide an explanation for a late scheduled completion date in the narrative report included with the schedule.

8-1.02D(3) Computer Software

Computer software must comply with section 8-1.02C(3).

8-1.02D(4) Data, Network Diagrams, and Reports

For each schedule submittal, submit:

1. 1 data-storage device containing the schedule data
2. 2 sets of originally plotted, time-scaled network diagrams
3. 2 copies of a narrative report

The data-storage device must comply with item 2 of the 3rd paragraph of section 8-1.02B(1).

The network diagrams must comply with section 8-1.02C(4) except the sheets must be 34 by 44 inches.

The narrative report must be organized in the following sequence with all applicable documents included:

1. Transmittal letter
2. Work completed during the period
3. Identification of unusual conditions or restrictions regarding labor, equipment, or material; including multiple shifts, 6-day work weeks, specified overtime or work at times other than regular days or hours
4. Description of the current critical path
5. Changes to the critical path and scheduled completion date since the last schedule submittal
6. Description of problem areas
7. Current and anticipated delays, including:
    7.1. Cause of delay
    7.2. Impact of delay on other activities, milestones, and completion dates
    7.3. Corrective action and schedule adjustments to correct the delay
8. Pending items and status of:
    8.1. Permits
    8.2. Change orders
    8.3. Time adjustments
    8.4. Noncompliance notices
9. Reasons for an early or late scheduled completion date in comparison to the work completion date

8-1.02D(5) Preconstruction Scheduling Conference

Hold a preconstruction scheduling conference with your project manager and the Engineer within 15 days after receipt of the fully executed Contract. At the discretion of the Engineer, this meeting may be combined with the preconstruction conference. The Engineer conducts the conference and reviews the specifications for a Level 3 CPM schedule with you.

Within 10 days after receipt of the fully executed Contract, submit a general time-scaled logic diagram showing the major activities and sequence of planned operations. Be prepared to

discuss the proposed work plan and schedule methodology during the preconstruction scheduling conference.

If the Contract includes construction staging and you propose changes to the described staging, the general time-scaled logic diagram must show the changes and resulting time impacts. Be prepared to discuss your proposal.

At this conference, submit the alphanumeric coding structure and activity identification system for labeling work activities.

To easily identify relationships, each activity description must indicate its associated scope or location of work by including such terms as quantity of material, type of work, bridge number, station to station location, side of highway (such as left, right, northbound, or southbound), lane number, shoulder, ramp name, ramp line descriptor, or mainline.

The Engineer reviews the logic diagram, coding structure, and activity identification system and provides any required baseline schedule changes to you for implementation.

8-1.02D(6) Baseline Schedule

The baseline schedule must comply with section 8-1.02C(5).

The baseline schedule must have a data date of Contract approval.

If you submit an early completion baseline schedule that shows work completion in less than 85 percent of the original working days, the baseline schedule must be supplemented with resource allocations for every task activity and include time-scaled resource histograms. Resource allocations must be shown to a level of detail that facilitates report generation based on labor crafts and equipment classes for you and your Subcontractors.

Use average composite crews to display the labor loading of job site construction activities. Optimize and level labor to reflect a reasonable plan for accomplishing the work and to assure that resources are not duplicated in concurrent activities.

The time-scaled resource histograms must show labor crafts and equipment classes to be used.

The Engineer may review the baseline schedule activity resource allocations using *Means Productivity Standards for Construction* or equivalent to determine whether the schedule is practicable.

8-1.02D(7) Updated Schedule

The updated schedule must comply with section 8-1.02C(6) except the 5th paragraph.

The updated schedule must:

1. Have a data date of the 21st day of the month or other date established by the Engineer
2. Show the status of work actually completed to date and the work yet to be performed as planned
3. Show actual activity start dates, percent complete, and finish dates
4. Show durations for work that has been completed as the work actually occurred, including the Engineer's review and your resubmittal times

Justify in writing the reasons for any changes to planned work. If any proposed changes in planned work results in altering a critical path or near critical path or extending the schedule completion date, submit a revised schedule and a TIA within 15 days of the proposed change.

8-1.02D(8) Time Impact Analysis

8-1.02D(8)(a) General

Submit a TIA with each request for adjustment of Contract Time or whenever you or the Engineer considers that an authorized or anticipated change may impact the critical path or work progress.

The TIA must:

1. Illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone.
2. Use the accepted schedule that has a data date closest to and before the event. If the Engineer determines that the accepted schedule used does not appropriately represent the conditions before the event, the accepted schedule must be updated to the day before the event being analyzed.
3. Include an impact schedule developed from incorporating the event into the accepted schedule by adding or deleting activities or by changing durations or logic of existing activities. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted schedule, the difference between scheduled completion dates of the 2 schedules must be equal to the adjustment of Contract Time.

The Engineer may construct and use an appropriate project schedule or other recognized method to determine adjustments in Contract Time until you submit the TIA.

Submit 2 copies of the TIA within 20 days of receiving a written request for a TIA. Allow the Engineer 15 days after receipt to review the submitted TIA. Authorized TIA schedule changes must be shown on the next updated schedule.

If a TIA you submit is rejected, meet with the Engineer to discuss and resolve issues related to the TIA. If clarification is needed after you meet, you are allowed 15 days to submit a protest. If agreement is not reached, you are allowed 5 days from the date you receive the Engineer's response to your protest to submit an Initial Notice of Potential Claim.

Show only actual as-built work, not unauthorized changes related to the TIA, in subsequent updated schedules.

If agreement is reached at a later date, the authorized TIA schedule changes must be shown on the next updated schedule.

The County withholds remaining payment on the progress schedule (critical path method) bid item if a TIA is requested and not submitted within 20 days.

The County returns the withhold in the next progress payment after the submittal of the requested TIA.

8-1.02D(8)(b) County-Owned Float

Prepare a TIA whenever requested to determine the effect of County-owned float. County-owned float is a resource for the exclusive use of the County.

The Engineer may accrue County-owned float by early review completion of any submittal if the early review completion saves time on the critical path.

The Engineer documents County-owned float by ordering you to update the County-owned float activity on the next updated schedule.

Include a log of the action on the County-owned float activity and include a discussion of the action in the narrative report.

The Engineer may use County-owned float to mitigate past, present, or future County delays by offsetting a potential time extension for a Change Order.

8-1.02D(8)(c) Ordered Changes

For an ordered change that affects the scheduled completion date, prepare a TIA to determine the effect of adjusting Contract working days.

Include the impacts of the ordered change in the next updated schedule.

An ordered change that affects the controlling activity on the critical path is a basis for a time adjustment.

The County grants a time extension only if the total float is absorbed and the scheduled completion date is delayed 1 or more working days due to the ordered change.

8-1.02D(9) Final Updated Schedule

The final updated schedule must comply with section 8-1.02C(7).

8-1.02D(10) Payment

Reserved

8-1.02E–8-1.02F RESERVED

8-1.03 PRECONSTRUCTION CONFERENCE

Attend a preconstruction conference with key personnel, including your assigned representative, at a time and location determined by the Engineer. Submit documents as required before the preconstruction conference. The County will provide you at least 5 days advanced notice of the date and time of the meeting.

The number of working days will be reduced by 1 working day for each day you fail to attend the conference with the appropriate representatives.

If the County elects to not hold the preconstruction conference meeting, you will be notified in writing.

Be prepared to discuss the topics and documents shown in the following table:

Topic	Document
Potential claim and dispute resolution	Potential claim forms
Contractor's representation	Assignment of Contractor's representative
Equipment	Equipment list
Labor compliance and equal employment opportunity	Job site posters and benefit and payroll reports
Material inspection	*Notice of Materials to be Used*
Measurements	--
Quality control	QC plans
Safety	Injury and Illness Prevention Program and job site posters
Schedule	Baseline schedule and *Weekly Statement of Working Days*
Subcontracting	*Subcontracting Request*
Surveying	--
Traffic control	Traffic contingency plan and traffic control plans
Utility work	--
Weight limitations	--
Water pollution control	SWPPP or WPCP
Work restrictions	PLACs
Action submittals	--

8-1.04 START OF JOB SITE ACTIVITIES

8-1.04A GENERAL

Reserved

8-1.04B STANDARD START

Start job site activities within 10 working days from the date of receipt of the County's Notice to Proceed. Do not begin work before receiving the Notice to Proceed.

Submit a notice 72 hours before starting job site activities. If the project has more than 1 location of work, submit a separate notice for each location.

8-1.04C DELAYED START

Reserved

8-1.04D EARLY RETURN-EARLY START

Reserved

8-1.04E NEXT-DAY START

Reserved

8-1.04F FLEXIBLE START

Reserved

8-1.04G POTENTIAL BUDGET IMPASSE START

Reserved

8-1.04H–8-1.04J RESERVED

8-1.05 TIME

Attention is directed to Section 80-07 of FAA Contract Provisions. Contract Time starts the first working day after the Contractor receives the County's Notice to Proceed.

Complete the work within the Contract Time.

Meet each specified Milestone.

The Engineer issues a *Weekly Statement of Working Days* by the end of the following week.

The *Weekly Statement of Working Days* shows:

1. Working days and non–working days during the reporting week
2. Time adjustments, if any
3. Work completion date computations, including working days remaining
4. Controlling activities

8-1.06 SUSPENSIONS

8-1.06A GENERAL

The Engineer may suspend work wholly or in part due to any of the following:

1. Conditions are unsuitable for work progress.
2. You fail to do any of the following:
   2.1. Fulfill the Engineer's orders.
   2.2. Fulfill a contract part.
   2.3. Perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur.

Upon the Engineer's written order of suspension, suspend work immediately.

Provide for public safety and a smooth and unobstructed passageway through the work zone during the suspension as specified in sections 7-1.03, "Public Convenience," and 7-1.04, "Public Safety."

Resume work when ordered.

8-1.06B SUSPENSIONS UNRELATED TO CONTRACTOR PERFORMANCE

For a suspension, unrelated to your performance, providing for a smooth and unobstructed passageway through the work during the suspension is force account work.

The days during a suspension unrelated to your performance are non-working days.

8-1.06C SUSPENSIONS RELATED TO CONTRACTOR PERFORMANCE

For a suspension related to your performance, providing for a smooth and unobstructed passageway through the work during the suspension will be at your expense. In the event you fail to provide for a smooth and unobstructed passageway through the work during the

suspension, the County may perform the work and deduct the cost from moneys due or to become due to you.

The days during a suspension related to your performance are working days.

8-1.07 DELAYS

8-1.07A GENERAL

In order to claim a delay-related time or payment adjustment, Contractor must follow the claim submittal process set forth in these General Conditions. The Contractor may request a delay-related time or payment adjustment through an RFI, but this does not excuse the Contractor from fully and timely complying with the Claims procedures.

8-1.07B TIME ADJUSTMENTS

8-1.07B(1) Delays to Critical Path

Extensions of time, when granted, will be based upon the effect of delays to the critical path of the work as a whole and will not be granted for non-controlling delays to included portions of work unless it can be shown that such delays did, in fact, delay the progress of the work as a whole.

8-1.07B(2) Conditions to Time Extensions

The Contract Time or Milestones shall be extended only if, in the opinion of County, the Contractor is necessarily delayed in completing the Contract by a cause that meets all the following conditions:

1. Such cause is beyond the control of Contractor, its Subcontractors, or material suppliers and is not due, in whole or in part, to the breach, negligence or fault of Contractor, its Subcontractors, or material suppliers;
2. Such cause arises after the Bid deadline and neither was nor could have been anticipated before the Bid deadline;
3. The effect of such cause could not be anticipated and avoided or mitigated by the exercise of all reasonable precautions, efforts and measures by the Contractor, including re-planning, scheduling and re-sequencing;
4. Such cause, in fact, results in a delay in the performance of the critical path of the work, which is not thereon thereafter recovered;
5. Contractor has given notice thereof and provided the back-up documentation and analysis as required by the Contract Documents or as requested by the Engineer or County including but not limited to as-planned versus as-built schedules; and
6. The Contractor has exercised all reasonable precautions, efforts and measures to accomplish such changes in the work without extending the date for completion.

8-1.07B(3) Excusable Non-Compensable Delay

The Parties acknowledge that Force Majeure events, as defined in section 1-1.07B, are not within the responsibility or control of the County or are reasonably contemplated by the Parties to occur during performance of the work, which may impact the schedule for performance of the work and may entitle Contractor to an extension of the Contract Time ("Excusable Non-Compensable Delays"). If the Critical Path of the work is delayed by Excusable Non-Compensable Delays, provided that such delays did not result from the acts of Contractor and further provided that Contractor takes reasonable precautions to prevent further delays owing to such causes, then

the Contract Time and/or Milestones shall be extended by a Change Order or Construction Change Directive.

An extension to the Contract Time and/or to the completion Milestone(s) identified in the Contract Documents shall be the Contractor's sole remedy for Excusable Non-Compensable Delays. In no event shall Contractor be entitled to any compensation or recovery of any damages in connection with the Excusable Non-Compensable Delays defined above.

8-1.07B(4) Excusable Compensable Delay

"Excusable Compensable Delay" means any delay to the critical path of the work occurring after commencement and prior to completion of the work:

1. which directly impacts the number of Working Days established in the Agreement for completion;
2. for which County is responsible, is unreasonable under the circumstances involved, and not within the contemplation of the Parties; and
3. is not due, in whole or in part, to the breach, negligence, or fault of Contractor, its Subcontractors, or Suppliers. Contractor's remedy for Excusable Compensable Delay shall be extension of the date for completion and Milestones subject to the Conditions to Time Extensions identified above and reimbursement of actual costs directly resulting from such delays and markup in accordance with section 9.

8-1.07B(5) Inexcusable Delay

"Inexcusable Delay" means any delay in the critical path of activities required for completion of the work resulting from causes other than those deemed to be an Excusable Non-Compensable Delay or an Excusable Compensable Delay by these General Conditions. An Inexcusable Delay shall not entitle Contractor to either an extension of the date for completion or Milestones or to any additional compensation whatsoever.

8-1.07B(6) Concurrent Delays

To the extent the Contractor is entitled to an extension of time due to an Excusable Non-Compensable Delay or to an Excusable Compensable Delay, but the performance of the work is independently suspended, delayed, or interrupted by an Inexcusable Delay, the delay shall be deemed to be a "Concurrent Delay."

In the case of a Concurrent Delay, Contractor shall be entitled to an extension of the Contract Time or Milestone(s) and Contractor shall not be entitled to any additional compensation whatsoever during the period of Concurrent Delay.

8-1.07B(7) Claim for Additional Time

Any claim for extension of time shall be made in writing within the time limits provided in section 5-1.43 herein. Within 10 days after commencement of such delay the Contractor shall furnish the Engineer with detailed information concerning the circumstances of the delay, the number of days actually delayed, the appropriate Contract Document references, and the measures taken to prevent or minimize the delay including an as-planned versus as-built schedule. The Contractor acknowledges the extreme importance of promptly notifying and thoroughly documenting any request for time extension and further specifically acknowledges that the County will suffer extreme prejudice should Contractor fail in any way to comply with this requirement.

8-1.07B(8) Limits on Adjustment of Contract Time or Contract Price for Material Shortages or Cost Escalation

No extension of Contract Time or adjustment of the Contract Price will be granted for a delay caused by a shortage of materials, unless the Contractor furnishes to the County documented proof that the Contractor has diligently made every effort to obtain such materials from every known source within reasonable reach of the work. The Contractor shall also submit proof, in the form of network analysis data that the inability to obtain such materials when originally planned did, in fact, cause a delay in completion of the work which could not be compensated for by revising the sequence of operations. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. No consideration will be given to any claim for adjustment of the Contract Price on the basis that material could not be obtained at a reasonable, practical, or economical cost, unless it is shown to the satisfaction of the County that such material could have been obtained only at exorbitant prices, entirely inconsistent with current rates taking into account the quantities involved and the usual practices in obtaining such quantities and that such fact could not have been known or anticipated at the time of Bid submission.

Contractor is aware that governmental agencies, such as gas companies, electrical utility companies, water districts and other agencies, may be required to approve Contractor-prepared drawings or approve a proposed installation. Contractor has endeavored to include the cost of such anticipated delays and related costs which may be caused by such agencies in Contractor's Bid. Thus, Contractor is not entitled to make claim upon the County for damages or delays arising from the delays caused by such agencies. Furthermore, the Contractor has scheduled for such delays and is not entitled to an extension of time for delays caused by governmental agencies which Contractor must obtain approvals from. No extension of time will be granted under this section 8-1.07B for any delay to the extent: (1) that performance would have been so delayed by any Contractor induced causes, including but not limited to the fault or negligence of the Contractor or its Subcontractors; or (2) for which any remedies are provided for or excluded by any other provision of the Contract.

8-1.07B(9) No Release of Sureties

An extension of time granted shall not release the sureties from their obligations. Work shall continue and be carried on in accordance with all the provisions of the Contract and the Contract shall be and shall remain in full force and effect during the continuance and until the completion and the County's final acceptance of the work covered by this Contract unless formally suspended or annulled in accordance with the terms of the Contract Documents.

8-1.07B(10) No Waiver by County

Neither the grant of an extension of time beyond the date fixed for the completion of any part of the work nor the doing and acceptance of any part of the work or materials specified by this Contract after the time specified for the completion of the work, shall be deemed to be a waiver of any other rights and remedies under the Contract.

8-1.07B(11) County's Right to Order Extraordinary Measures to Mitigate Delay

In the event of delays to the Project, the Engineer may order Extraordinary Measures as provided below.

8-1.07B(11)(a) Non-Compensable Extraordinary Measures

In the event the Engineer determines that the performance of the work, or any portion thereof, has not progressed or reached the level of completion required by the Contract Documents due to causes within the control of Contractor, the Engineer shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, and facilities, and (3) submitting a recovery schedule for re-sequencing performance of the work or other similar measures (hereinafter referred to collectively as Extraordinary Measures). Such Extraordinary Measures shall continue until the progress of the work complies with the stage of completion as required by the Contract Documents. The Contractor shall not be entitled to an adjustment in the Contract Price in connection with the Extraordinary Measures required by the County under or pursuant to this section. The County may exercise the rights furnished the County under or pursuant to this section as frequently as the County deems necessary to ensure that the Contractor's performance of the work will comply with the Contract Time, or interim completion date set forth in the Contract Documents. If Contractor or its Subcontractors fail to commence Extraordinary Measures within forty-eight (48) hours of County's written demand, the County may, without prejudice to other remedies, take corrective action at the expense of Contractor.

8-1.07B(11)(b) Compensable Extraordinary Measures

The Engineer, in its discretion, may issue a written request, to the Contractor requesting Contractor to submit an itemized proposal for Extraordinary Measures in order to achieve early completion of all or a portion of the work, due to no fault of the Contractor, in a form acceptable to the County within 10 days after the County's issuance of the request. Contractor's proposal shall be limited to direct labor cost (itemized hours and rates) and overhead and profit on the labor costs.

8-1.07B(12) Continuation of the Work

If the construction of the work is not completed within the Contract Time, as may be extended by the County, the Contractor shall continue performing the work in accordance with the Contract Documents until the completion of and the acceptance of the work, or Contractor's performance is suspended or terminated.

8-1.07C PAYMENT ADJUSTMENTS

The County may make a payment adjustment for an excusable delay that affects your costs.

Only losses for idle equipment, idle workers, and moving or transporting equipment are eligible for delay-related payment adjustments.

The Engineer determines payment for idle time of equipment in the same manner as determinations are made for equipment used in the performance of force account work under section 9-1.04 with the following exceptions:

1. Delay factor in the Labor Surcharge and Equipment Rental Rates applies to each equipment rental rate.
2. Daily number of payable hours equals the normal working hours during the delay, not to exceed 8 hours per day.
3. Delay days exclude non–working days.
4. Markups are not added.

The Engineer determines payment adjustment for the idle workers under section 9-1.04B, but does not add markups.

The Engineer includes costs due to necessary extra moving or transporting of equipment.

The County does not make a payment adjustment for overhead incurred during non–working days of additional construction seasons experienced because of delay.

8-1.07D NO EARLY COMPLETION DELAY DAMAGES

While the Contractor may schedule completion of all of the work, or portions thereof, earlier than the Contract Time, the County is exempt from liability for and the Contractor shall not be entitled to an adjustment of the Contract Price or to any additional costs, damages, including, but not limited to, claims for extended general conditions costs, home office overhead, job site overhead and management or administrative costs, or compensation whatsoever, for use of Float or for Contractor's inability to complete the work earlier than the Contract Time for any reason whatsoever, including but not limited to, delay caused by the County or other Excusable Compensable Delay.

8-1.08–8-1.09 RESERVED

8-1.10 LIQUIDATED DAMAGES

8-1.10A GENERAL

Attention is directed to FAA General Contract Provisions 80-08. The County specifies liquidated damages in the Agreement. Liquidated damages, if any, accrue starting on the 1st day after the expiration of the working days through the day of Contract acceptance.

The County withholds liquidated damages before the accrual date if the anticipated liquidated damages may exceed the value of the remaining work.

8-1.10B-8-1.10D RESERVED

8-1.11–8-1.12 RESERVED

8-1.13 CONTRACTOR'S CONTROL TERMINATION

Reserved

8-1.14 CONTRACT TERMINATION

8-1.14A TERMINATION BY THE CONTRACTOR

The Contractor shall have the right to terminate the Contract only upon the occurrence of one of the following:

1. The work stopped for ninety (90) consecutive days, though no act or fault of Contractor, any Subcontractor, or any employee or agent of Contractor or any Subcontractor, due to an issuance of an order of a court or other public authority having jurisdiction, or due to an act of government such as a declaration of a national emergency making material unavailable; or
2. The County fails to perform any material obligation under the Contract Documents and fails to cure such default within 90 days after receipt of notice from Contractor stating the nature of such default.

8-1.14B TERMINATION BY THE COUNTY FOR CAUSE

8-1.14B(1) Grounds

Attention is directed to Section 90-09 and 80-10 of the FAA General Contract Provisions. The County shall have the right to terminate the Contractor's performance of the work, in whole or in part, if:

1. Contractor fails to promptly commence the work or unnecessarily or unreasonably delays the work or improperly discontinues the prosecution of the work or abandons the work;
2. Contractor refuses or fails to supply skilled supervisory personnel, an adequate number of properly skilled workers, proper materials, or necessary equipment to perform the work in strict accordance with the Contract Documents, and the latest accepted schedule;
3. Contractor fails to make prompt payment of amounts properly due Subcontractors after receiving payment from the County;
4. Contractor disregards applicable laws, statutes, ordinances, codes, rules, regulations, or lawful orders of a public authority;
5. Contractor fails to resume performance of work which has been suspended or stopped, within a reasonable time after receipt of notice from the County to do so or (if applicable) after cessation of the event preventing performance;
6. Any representation or warranty made by Contractor in the Contract Documents or any certificate, schedule, instrument, or other document delivered by Contractor pursuant to the Contract Documents shall have been false or materially misleading when made;
7. After commencement of the work the County becomes aware that the Contractor is using an ineligible contractor, Subcontractor, or supplier who was barred from performing work or providing materials or services on County projects at the time of Bid;
8. Contractor fails to make payment to Subcontractors for materials or labor in accordance with the respective Contract Documents and applicable law;
9. The Contract is assigned or the work is sublet otherwise than as specified in the Contract Documents;
10. Contractor otherwise is guilty of breach of a provision of the Contract Documents; or
11. Contractor materially fails to execute the work in accordance with the Contract Documents or, in the County's opinion, is violating any of the terms of the Contract or is not executing the Contract in good faith or is not following instructions of the County as to additional force necessary in the opinion of the County for its completion within the required time.

8-1.14B(2) County's Rights Upon Termination of Contract

When any of the reasons specified above exist, the County may, in addition to and without prejudice to any other rights or remedies of the County, notify the Contractor not to resume or to discontinue all work, or any part thereof, by written notice of default. The County will advise the performance bond surety of the notice of default and that it will be given 15 days to arrange for completion of the work in accordance with the Contract Documents by another contractor or contractors satisfactory to the County. Should the surety fail to effect satisfactory arrangements within said 15-day period, the County shall have the right to issue a notice of termination and to:

1. Exclude the Contractor from the Site;
2. Take possession of the Site and of all materials, equipment, tools and construction equipment, and machinery thereon owned by the Contractor;
3. Suspend any further payments to Contractor;
4. Accept assignment of subcontracts pursuant to section 5-1.02; and

5. Finish the work by whatever reasonable method the County may deem expedient.

When the County terminates the Contractor's performance of the work for one of the reasons stated in this section 8-1.14B, the Contractor shall not be entitled to receive further payment until the work is finished.

The County shall charge the cost to complete the work, including, but not limited to, protection, investigation, labor, services, equipment, materials, permits, fees, supervisory, and administrative costs to Contractor and its performance bond surety. If the unpaid balance of the Contract Price is less than all costs of finishing the work, including compensation for the County's services and expenses made necessary thereby, and other damages incurred by the County and not expressly waived, the Contractor shall pay the difference to the County. This obligation for payment shall survive termination of the Contract. If the unpaid balance of the Contract Price is greater than all costs of finishing the work, including compensation for the County's services and expenses made necessary thereby, the Contractor shall receive payment for work properly performed by Contractor for which payment was not made previously; any excess amounts shall be retained by the County.

8-1.14B(3) Erroneous Termination

If it has been adjudicated or otherwise determined that the County has erroneously or negligently terminated the Contractor for cause, then said termination shall automatically convert to a termination by the County for convenience as set forth in section 8-1.14C.

8-1.14B(4) Acceptance of Incomplete or Noncompliant Work

In lieu of the provisions of this section for terminating the Contractor's performance, the County may pay the Contractor for the portion of work completed according to the provisions of the Contract Documents and may treat the incomplete work as if they had never been included or contemplated by this Contract, in which case the Contract Price will be reduced by the value of the deleted work determined in accordance with section 4-1.05M. The County may also exercise its rights under section 5-1.30 relating to acceptance of noncompliant work. No claim under this provision will be allowed the Contractor for overhead or prospective profits on work not completed by the Contractor.

8-1.14B(5) Adequate Financial Assurances

It is recognized that if Contractor is adjudged a bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed for the benefit of its creditors, or if a receiver is appointed on account of Contractor's insolvency, this could impair or frustrate Contractor's performance of the work. Accordingly, it is agreed that upon the occurrence of any such event, the County shall be entitled to request of Contractor, or its successor in interest, adequate assurance of future performance in accordance with the terms and conditions hereof. Failure to comply with such request within 5 days of delivery of the request shall entitle the County to terminate the Contract and to the accompanying rights set forth above. Pending receipt of adequate occurrence of performance and actual performance in accordance therewith, the County shall be entitled to proceed with the work with its own forces or with other contractors on a time and material or other appropriate basis, the cost of which will be back charged against the Contract Price.

8-1.14C TERMINATION BY THE COUNTY FOR CONVENIENCE

The County may, at any time, terminate the Contractor's performance of the work, in whole or in part, for the County's convenience without regard to Contractor's fault or breach upon 14 days' written notice to Contractor.

In the event that the County terminates Contractor's performance of the work for convenience, Contractor agrees to waive any claims for damages, including, but not limited to, home office overhead, loss of anticipated profits on account thereof, and as the sole right and remedy of Contractor, the County shall pay Contractor in accordance with section 8-1.14E below. The provisions of the Contract, which by their nature survive final acceptance of the work, shall remain in full force and effect after such termination to the extent provided in such provisions.

8-1.14D CONTRACTOR'S DUTIES UPON TERMINATION

Upon receipt of written notice from the County of such termination for cause or for the County's convenience, the Contractor shall, unless the notice directs otherwise, do the following:

1. cease performance of the work to the extent specified in the notice;
2. cooperate with the County to secure the site and demobilize in a safe and orderly fashion;
3. take actions necessary, or that the County may direct, for the protection and preservation of the work;
4. except for work directed to be performed in the notice, incur no further costs and enter into no further subcontracts and purchase orders;
5. if requested by the County, assign to the County, in the manner and to the extent directed, all of the right, title and interest to the Contractor under the subcontracts, and the County shall have no liability for acts, omissions or causes of action resulting therefrom which accrued prior to the date of termination and assignment, which liability shall remain with the Contract; and
6. turn over to the County, as soon as possible, but not later than 30 days after receipt of such termination notice, the originals of all of the Contractor's records, files, documents, drawings and any other items relating to the Project, whether located on the job site, at the Contractor's office or elsewhere.

8-1.14E RESPONSIBILITY FOR MATERIALS

Upon receiving a termination notice, protect unused material until:

1. You submit an inventory of materials already produced, purchased, or ordered but not yet used; include the location of the material.
2. The Engineer identifies materials that will be retained by the County. Submit bills of sales or other records of material title.
3. The Engineer confirms that unused materials paid by progress payment and materials furnished by the State have been delivered and stored as ordered.
4. The titles are transferred for materials purchased by the County.

Dispose of materials that will not be retained by the County.

8-1.14F CONTRACT ACCEPTANCE AFTER TERMINATION

The Engineer recommends Contract acceptance after determining completion of:

1. Work ordered to be completed before termination
2. Other work ordered to secure the project before termination

3. Material delivery and title transfer

The County pays you under section 9-1.17.

8-1.14G PAYMENT ADJUSTMENT FOR TERMINATION

If the County issues a termination notice, the Engineer determines payment for termination based on the following:

1. Direct cost for the work:
    1.1. Including:
        1.1.1. Mobilization.
        1.1.2. Demobilization.
        1.1.3. Securing the job site for termination.
        1.1.4. Losses from the sale of materials.
    1.2. Not including:
        1.2.1. Cost of materials you keep.
        1.2.2. Profit realized from the sale of materials.
        1.2.3. Cost of material damaged by:
            1.2.3.1. Act of God.
            1.2.3.2. Act of a public enemy.
            1.2.3.3. Fire.
            1.2.3.4. Flood.
            1.2.3.5. Governor-declared state of emergency.
            1.2.3.6. Landslide.
            1.2.3.7. Tsunami.
        1.2.4. Other credits.
2. Cost of remedial work, as estimated by the Engineer, is not reimbursed.
3. Allowance for profit not to exceed 4 percent of the cost of the work. Prove a likelihood of having made a profit had the Contract not been terminated.
4. Material handling costs for material returned to the vendor or disposed of as ordered.
5. Costs in determining the payment adjustment due to the termination, excluding attorney fees and litigation costs.

Termination of the Contract does not relieve the surety of its obligation for any just claims arising out of the work performed.

8-1.15 TERMINATION BY THE COUNTY FOR NON-APPROPRIATION

County's obligation to pay any amounts due for those fiscal periods succeeding the current fiscal period are contingent upon appropriation or approval of funds for that purpose. If such funds become unavailable, then County may elect to terminate this Contract by giving written notice of termination to Contractor effective immediately or on such other date as County specifies in the notice. If partial funds are appropriated or provided, the County shall have the option to either terminate this Contract with no liability to the County or offer a Contract amendment to the Contractor to reflect the reduced amount.

In the event that the County terminates Contractor's performance of the work for non-appropriation, Contractor agrees to waive any claims for damages, including, but not limited to, home office overhead, loss of anticipated profits on account thereof, and as the sole right and remedy of Contractor, the County shall pay Contractor in accordance with section 8-1.14G.

The provisions of the Contract, which by their nature survive final acceptance of the work, shall remain in full force and effect after such termination to the extent provided in such provisions.

8-1.16 RESERVED

9 PAYMENT

9-1.01 GENERAL

Section 9 includes specifications related to work payment. Attention is directed to Section 90 of the FAA General Contract Provisions.

9-1.02 MEASUREMENT

9-1.02A GENERAL

Bid item quantities are determined under U.S. customary units.

Except for final pay item quantities are measured for payment.

9-1.02B WEIGHING EQUIPMENT AND PROCEDURES

9-1.02B(1) General

Measure material quantities for payment with devices that comply with:

1. 4 California Code of Regulations § 4000 et seq.
2. Business and Professions Code § 12001 et seq.

To determine the material payment quantities, use measuring devices that have been sealed by the Department of Food and Agriculture's Division of Measurement Standards or its designated representative.

If a device is not type approved by the Division of Measurement Standards, type approve it under California Test 109.

Notify the Engineer at least 1 business day before equipment testing.

Use material plant controllers having elements affecting the data accuracy and delivery that have been sealed by the Engineer. Make these elements available to the Engineer for inspection. If the elements are adequate for use, the Engineer seals them. If manipulation of a security seal occurs, stop material production. Do not resume production until the Engineer reinspects and reseals the device.

Measure material paid for by weight on sealed scales regularly inspected by the Department of Food and Agriculture's Division of Measurement Standards or its designated representative.

Obtain authorization of portable vehicle scale installations before sealing.

9-1.02B(2) Equipment

Each scale must be long enough to fit an entire vehicle or a combination vehicle on the scale deck. The County allows you to weigh a combination vehicle separately if you disconnect the vehicles.

Construct scale undersupports:

1. Using portland cement concrete containing at least 470 pounds of cementitious material per cubic yard produced from commercial quality materials
2. Such that footing heights are at least 20 inches thick
3. With a bearing surface at least 30 inches wide and bearing pressure on the footing not over 4,000 lb/sq ft

In constructing a scale:

1. Provide drainage to prevent water from saturating the ground under the scale
2. Use bulkheads that prevent displacement
3. If shimming is necessary:
   3.1. Use securely attached metal shims or grout
   3.2. Do not use wedges to shim the supports
   3.3. Do not use shim material in excess of 3 inches
4. Install mechanical indicating elements level, plumb, and rigidly mounted on the concrete undersupports
5. For a hopper scale, rigidly attach the lever systems and mechanical indicating elements such that no weight is lost from bending or support distortion

Each scale used to determine material payment quantities must be operated by a licensed weighmaster (Business and Professions Code § 12700 et seq.).

Submit a public weighmaster's certificate or certified daily summary weigh sheets for each weighed material quantity. The County may witness material weighing and check and compile the daily scale weight record.

Each vehicle operator must obtain weight or load slips from the weighmaster. Submit these records at the delivery point.

9-1.02B(3) Procedures

Each day weigh empty vehicles used to haul material paid for by weight. Each vehicle must have a legible identification mark. The County may verify a material weight by having an empty and loaded vehicle weighed on any scale the Engineer designates.

If imported topsoil, soil amendment, wood mulch, or compost is measured by volume:

1. Each vehicle must allow for an accurate determination of its contents
2. Unless vehicles are of uniform capacity, each vehicle must have a legible identification mark showing its volumetric capacity
3. Load vehicles to at least the volumetric capacity
4. Level vehicle loads on arrival at the delivery point

If determining a quantity paid on a volume basis is impractical or if authorized, weigh the material and the Engineer converts the result to a volume measurement. The Engineer determines the conversion factors and, if you agree, adopts this method of measurement.

9-1.02C FINAL PAY ITEM QUANTITIES

The County shows a bid item quantity as a final pay item for payment purposes only. For a final pay item, accept payment based on the Bid Item List quantity, regardless of the actual quantity used unless dimensions are changed by the Engineer.

9-1.02D QUANTITIES OF AGGREGATE AND OTHER ROADWAY MATERIALS

The weight of aggregate and other roadway material that are being paid for by weight are determined as shown in the following table and does not include the deducted weight of water in their payment quantities:

Determination of Quantities of Aggregate and Other Roadway Materials

Material	Quantity determination
Aggregate or other roadway material except as otherwise shown in this table	By deducting the weight of water in the material[a] in excess of 3 percent of the dry weight of the material from the weight of the material
Imported borrow, imported topsoil, AB	By deducting the weight of water in the material[a] in excess of 6 percent of the dry weight of the material from the weight of the material
Straw	By deducting the weight of water in the material[a] in excess of 15 percent of the dry weight of the material from the weight of the material
Fiber[b]	Engineer does not deduct the weight of water
AB and aggregate for cement treated bases	As specified in section 26 and section 27

NOTE: Percentage of water is determined by California Test 226.

[a]At the time of weighing

[b]Weight of water in the fiber[a] must not exceed 15 percent of the dry weight of the fiber.

9-1.03 PAYMENT SCOPE

The County pays you for furnishing the resources and activities required to complete the work. The County's payment is full compensation for furnishing the resources and activities, including, but not limited to:

1. Risk, loss, damage repair, or cost of whatever character arising from or relating to the work and performance of the work
2. PLACs and taxes
3. Any royalties and costs arising from patents, trademarks, and copyrights involved in the work

The County does not pay for your loss, damage, repair, or extra costs of whatever character arising from or relating to the work that is a direct or indirect result of your choice of construction methods, materials, equipment, or manpower, unless specifically mandated by the Contract.

Payment is:

1. Full compensation for all work involved in each bid item shown on the Bid Item List by the unit of measure shown for that bid item
2. For the price bid for each bid item shown on the Bid Item List or as changed by change order

Full compensation for work specified in these General Conditions and divisions II and XI of the Standard Specifications is included in the payment for the bid items unless:

1. Bid item for the work is shown on the Bid Item List
2. Work is specified as change order work

Work paid for under one bid item is not paid for under any other bid item. Payment for a bid item includes payment for work in sections referenced by the section set forth by that bid item.

Payment for a bid item includes payment for all work and costs relating to that bid item under the Contract Documents, including all profit and all direct and indirect costs, including but not limited to overhead, bonds, insurance, and any other fixed or administrative costs.

If the amount of a deduction or withhold exceeds final payment, the County shall invoice Contractor for the difference; Contractor shall pay said invoice upon receipt.

9-1.04 FORCE ACCOUNT

9-1.04A GENERAL

For work paid by force account, the Engineer compares the County's records to your daily force-account work report. When you and the Engineer agree on the contents of the daily force-account work reports, the Engineer accepts the report and the County pays for the work. If the records differ, the County pays for the work based only on the information shown on the County's records.

If a Subcontractor performs work at force account, accept an additional 10 percent markup to the total cost of that work paid at force account, including markups specified in section 9-1.04, as reimbursement for additional administrative costs.

The markups specified for labor, materials, and equipment include compensation for all delay costs, overhead costs, and profit.

If an item's unit price is adjusted for work-character changes, the County excludes your cost of determining the adjustment.

Payment for owner-operated labor and equipment is made at the market-priced invoice submitted.

For nonsubcontracted work paid by force account for a contract with a TRO bid item, the markups are those shown in the following table instead of those specified in sections 9-1.04B though 9-1.04D:

Cost	Percent markup
Labor	30
Materials	10
Equipment rental	10

9-1.04B LABOR

Labor payment is full compensation for the cost of labor used in the direct performance of the work plus a 35 percent markup. Force-account labor payment consists of:

1. Employer payment to the worker for:
   1.1. Basic hourly wage
   1.2. Health and welfare
   1.3. Pension
   1.4. Vacation
   1.5. Training
   1.6. Other State and federal recognized fringe benefit payments
2. Labor surcharge percentage in *Labor Surcharge and Equipment Rental Rates* current during the work paid at force account for:
   2.1. Workers' compensation insurance

2.2. Social security
2.3. Medicare
2.4. Federal unemployment insurance
2.5. State unemployment insurance
2.6. State training taxes
3. Subsistence and travel allowances paid to the workers
4. Employer payment to supervisors, if authorized

The 35 percent markup consists of payment for all overhead costs related to labor but not designated as costs of the labor used in the direct performance of the work including:

1. Home office overhead
2. Field office overhead
3. Bond costs
4. Profit
5. Labor liability insurance
6. Other fixed or administrative costs that are not costs of labor used in the direct performance of the work

9-1.04C MATERIALS

Material payment is full compensation for materials you furnish and use in the work. The Engineer determines the cost based on the material purchase price, including delivery charges, except:

1. 15 percent markup is added
2. Supplier discounts are subtracted whether you took them or not
3. If the Engineer believes the material purchase prices are excessive, the County pays the lowest current wholesale price for a similar material quantity
4. If you procured the materials from a source you wholly or partially own, the determined cost is based on the lower of the:
   4.1. Price paid by the purchaser for similar materials from that source on Contract items
   4.2. Current wholesale price for those materials
5. If you do not submit a material cost record within 30 days of billing, the determined cost is based on the lowest wholesale price:
   5.1. During that period
   5.2. In the quantities used

9-1.04D EQUIPMENT RENTAL

9-1.04D(1) General

Equipment rental payment is full compensation for:

1. Rental equipment costs, including moving the equipment to and from the Change Order Work site using its own power.
2. Transport equipment costs for rental equipment that cannot be transported economically using its own power. No payment is made during transport for the transported equipment.
3. 15 percent markup.

If you want to return the equipment to a location other than its original location, the payment to move the equipment must not exceed the cost of returning the equipment to its original location.

If you use the equipment for work other than work paid by force account, the transportation cost is included in the other work.

Before moving or loading the equipment, obtain authorization for the equipment rental's original location.

The Engineer determines rental costs:

1. Using the rates in *Labor Surcharge and Equipment Rental Rates*:
    1.1. By classifying equipment using manufacturer's ratings and manufacturer-approved changes.
    1.2. Current during the work paid by force account.
    1.3. Regardless of equipment ownership; but the County uses the rental document rates or minimum rental cost terms if:
        1.3.1. Rented from an equipment business you do not own.
        1.3.2. Hourly rate in *Labor Surcharge and Equipment Rental Rates* is $10.00 per hour or less.
2. Using the rates established by the Engineer for equipment not listed in *Labor Surcharge and Equipment Rental Rates*. You may submit cost information that helps the Engineer establish the rental rate; but the County uses the rental document rates or minimum rental cost terms if:
    2.1. Rented from an equipment business you do not own.
    2.2. The Engineer establishes a rate of $10.00 per hour or less.
3. Using rates for transport equipment not exceeding the hourly rates charged by established haulers.

Equipment rental rates include the cost of:

1. Fuel
2. Oil
3. Lubrication
4. Supplies
5. Small tools that are not consumed by use
6. Necessary attachments
7. Repairs and maintenance
8. Depreciation
9. Storage
10. Insurance
11. Incidentals

The County pays for small tools consumed by use. The Engineer determines the payment for small tools consumed by use based on Contractor-submitted invoices.

The Engineer may authorize rates in excess of those in the *Labor Surcharge and Equipment Rental Rates* if:

1. You submit a request to use rented equipment
2. Equipment is not available from your normal sources or from one of your Subcontractors
3. Rented equipment is from an independent rental company
4. Proposed equipment rental rate is reasonable
5. The Engineer authorizes the equipment source and the rental rate before you use the equipment

The County pays for fuel consumed during the operation of rented equipment not included in the invoiced rental rates.

9-1.04D(2) Equipment On the Job Site

For equipment on the job site at the time required to perform work paid by force account, the time paid is the time:

1. To move the equipment to the location of work paid by force account plus an equal amount of time to move the equipment to another location on the job site when the work paid by force account is completed
2. To load and unload equipment
3. Equipment is operated to perform work paid by force account and:
   3.1. Hourly rates are paid in 1/2-hour increments
   3.2. Daily rates are paid in 1/2-day increments

9-1.04D(3) Equipment Not On the Job Site and Not Required for Original-Contract Work

For equipment not on the job site at the time required to perform work paid by force account and not required for original Contract work, the time paid is the time the equipment is operated to perform work paid by force account and the time to return the equipment to its source when the work paid by force account is completed.

The minimum total time paid is:

1. 1 day if daily rates are paid
2. 8 hours if hourly rates are paid

If daily rates are recorded, equipment:

1. Idled is paid as 1/2 day
2. Operated less than 4 hours is paid as 1/2 day
3. Operated 4 hours or more is paid as 1 day

If the minimum total time exceeds 8 hours and if hourly rates are listed, the County rounds up hours operated to the nearest 1/2-hour increment and pays based on the hours shown the following table. The table does not apply when equipment is not operated due to breakdowns, in which case rental hours are the hours the equipment was operated.

Equipment Rental Hours

Hours operated	Hours paid
0.0	4.00
0.5	4.25
1.0	4.50
1.5	4.75
2.0	5.00
2.5	5.25
3.0	5.50
3.5	5.75
4.0	6.00
4.5	6.25
5.0	6.50
5.5	6.75
6.0	7.00
6.5	7.25

7.0	7.5
7.5	7.75
≥8.0	hours used

9-1.04D(4) Equipment Not On the Job Site and Required for Original-Contract Work

For equipment not on the job site at the time required to perform work paid by force account and required for the original Contract work, the time paid is the time:

1. To move the equipment to the location of work paid by force account plus an equal amount of time to return the equipment to a location on the job site or its source when the work paid by force account is completed
2. Equipment is operated to perform work paid by force account

9-1.04D(5) Non-Owner-Operated Dump Truck Rental

Submit the rental rate for a non-owner-operated dump truck. The Engineer determines the payment rate. Payment for the rental of a non-owner-operated dump truck is for the cost of renting a dump truck, including its driver. For the purpose of markup payment only, the non-owner-operated dump truck is rental equipment and the owner is a Subcontractor.

9-1.05 EXTRA WORK PERFORMED BY SPECIALISTS

If the Engineer determines that you or your Subcontractors are not capable of performing specialty extra work, a specialist may be used. Itemize the labor, material, and equipment rental costs unless it is not the special service industry's established practice to provide itemization, in which case, the Engineer accepts current market-priced invoices for the work.

The Engineer may accept an invoice as a specialist billing for work performed at an off–job site manufacturing plant or machine shop.

The Engineer determines the cost based on the specialist invoice price minus any available or offered discounts plus a 10 percent markup.

9-1.06 CHANGED QUANTITY PAYMENT ADJUSTMENTS

9-1.06A GENERAL

The unit prices specified in section 9-1.06 are adjusted under section 9-1.04.

9-1.06B INCREASES OF MORE THAN 25 PERCENT

If the total bid item quantity exceeds 125 percent of the quantity shown on the Bid Item List and if no approved Change Order addresses payment for the quantity exceeding 125 percent, you may request a unit price adjustment. If an adjustment is warranted, the Engineer has the option of either adjusting the unit price for the excess quantity under section 9-1.04 or the following:

1. The adjustment is the difference between the unit price and the unit cost of the total item pay quantity.
2. In determining the unit cost, the Engineer excludes the item's fixed costs. You have recovered the fixed costs in the payment for 125 percent shown on the Bid Item List.
3. After excluding fixed costs, the Engineer determines the item unit cost under section 9-1.04.

If the payment for the number of units of a bid item in excess of 125 percent of the Bid Item List is less than $5,000 at the unit price, the Engineer may not adjust the unit price unless you request it.

Provide written request of adjustment with adequate, detailed data to support actual costs incurred.

9-1.06C DECREASES OF MORE THAN 25 PERCENT

If the total item pay quantity is less than 75 percent of the quantity shown on the Bid Item List and if no approved Change Order addresses payment for the quantity less than 75 percent, you may request a unit price adjustment. If an adjustment is warranted, the Engineer has the option of either adjusting the unit price for the decreased quantity under section 9-1.04 or the following:

1. The adjustment is the difference between the unit price and the unit cost of the total pay quantity.
2. In determining the unit cost, the Engineer includes the item's fixed costs.
3. After including fixed costs, the Engineer determines the item unit cost under section 9-1.04.

The County does not pay more than 75 percent of the item total in the Bid Item List.

Provide written request of adjustment with adequate, detailed data to support actual costs incurred.

9-1.06D ELIMINATED BID ITEMS

If the Engineer eliminates a bid item, the Engineer notifies you and the County pays your costs incurred before the notification date.

If you order authorized material for an eliminated bid item before the notification date and the order cannot be canceled, either of the following occurs:

1. If the material is returnable to the vendor, the Engineer orders you to return the material and the County pays your handling costs and vendor charges.
2. The County pays Contractor’s actual cost for the material and its handling and becomes the material owner.

The Engineer determines the payment for the eliminated bid item pursuant to section 9-1.04.

9-1.07–9-1.14 RESERVED

9-1.15 WORK-CHARACTER CHANGES

The County adjusts a bid item unit price based on the difference between the cost to perform the work as planned and the cost to perform the work as changed, if it meets the requirements of section 4-1.05B. The Engineer determines the payment adjustment under section 9-1.04. The County adjusts payment for only the work portion that changed in character.

9-1.16 PROGRESS PAYMENTS

9-1.16A APPLICATIONS FOR PAYMENT

9-1.16A(1) General

Based upon Applications for Payment submitted to the Engineer by the Contractor, the County shall make progress payments to the Contractor as provided below and elsewhere in the Contract Documents.

The pay period covered by each Application for Payment shall be one calendar month ending on the 20th day of the month.

The Contractor shall submit each Application for Payment to the Engineer by the last day of each month.

Pursuant to section 9-1.02 above, Contractor's Applications for Payment shall be based on the actual installed quantities for payment.

Applications for Payment shall indicate the percentage of completion of each portion of the work for which a lump sum price is specified as of the end of the period covered by the Application for Payment.

9-1.16A(2) Applications for Payment

Contractor shall submit to the Engineer an Application for Payment on a form furnished by the Engineer for work completed in accordance with the measurement of quantities. Such application shall be supported by such data substantiating the Contractor's right to payment as the Engineer may require.

By submitting an Application for Payment, the Contractor warrants that all work has been performed in compliance with the Contract Documents, and that all quantities and amounts set forth therein accurately reflect the amount of work completed during that pay period.

Each Application for Payment shall be reviewed by the Engineer as soon as practicable after receipt for the purpose of determining that the Application for Payment is a "proper" payment request, accurately reflecting the value of work completed and submitted with the documents required by the Contract Documents. An Application for Payment shall be deemed "proper" only if it is properly completed and submitted on the proper forms. The Engineer shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any Application for Payment.

The County shall make payment to the Contractor not later than 30 days after the Engineer's verification and approval that an Application for Payment is undisputed and properly submitted.

The Contractor may elect to allow an alternative procedure for processing monthly applications for payment whereby the Engineer prepares monthly progress payment estimates. To initiate such alternative procedure, the Contractor shall submit to the Engineer a written request (before the 10th day of the month) which authorizes the Engineer to prepare the monthly progress payment estimates for all remaining payments due under the Contract. Under such alternative procedure, the County, once in each month, shall cause an estimate in writing to be made by the Engineer, and the Contractor's signature approving the progress payment estimate shall be considered to be "receipt of an undisputed and properly submitted payment request" from the Contractor under Public Contract Code section 20104.50, and the County shall make payment to the Contractor within 30 days after such receipt.

Applications for Payment shall include the following:

Contractor's Verification: Contractor has carefully prepared this entire document and hereby attests that the quantities and amounts stated herein accurately represent the total work that has been performed in compliance with the Contract Documents. Contractor will pay any released retainage to Subcontractor due to accepted complete work of the Subcontractors portion of the work within 30 days of receipt of payment.

Under the alternative procedure described above, progress pay estimates prepared by the Engineer shall include the following:

Contractor's Verification: Contractor has carefully reviewed this entire document and hereby attests that the quantities and amounts stated herein accurately represent the total work that has been performed in compliance with the Contract Documents. Contractor will pay any released retainage to Subcontractor due to accepted complete work of the Subcontractors portion of the work within 30 days of receipt of payment.

9-1.16A(3) Payments for Authorized Changes

Applications for Payment may include requests for payment on account of changes in the work that have been properly authorized by Change Orders and by Construction Change Directives, which shall be itemized separately from base Contract work.

9-1.16A(4) No Requests for Disputed Subcontractor Work

Applications for Payment shall not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason, or as to which an appropriate stop payment notice release has not been filed.

9-1.16A(5) Improper Application for Payment

In accordance with Public Contract Code section 20104.50, any Application for Payment determined by the Engineer not to be a proper payment request, suitable for payment, shall be returned to the Contractor as soon as practicable, but not later than 7 days after receipt by the Engineer. An Application for Payment returned to the Contractor shall be accompanied by written documentation setting forth the reasons why the Application for Payment is not proper and not suitable for payment. If an Application for Payment is so returned as improper, no payment will be due the Contractor. The County reserves the right to make partial payment of undisputed amounts.

9-1.16A(6) Interest on Undisputed Amounts

If the County fails to make any progress payment within 30 days after receipt of an undisputed and proper Application for Payment from the Contractor, the County shall pay interest to the Contractor equivalent to the legal rate set forth in California Code of Civil Procedure section 685.010(a). The number of days available to the County to make a payment without incurring interest shall be reduced by the number of days by which the Engineer exceeds the 7 day return requirement set forth above.

9-1.16A(7) Contractor Warranty of Project

The Contractor warrants that upon submittal of an Application for Payment, all work for which payments have been received from the County shall, to the best of the Contractor’s knowledge, information and belief, be free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the work. This provision shall not relieve the Contractor from the responsibility for materials and work upon which payments have been made, the restoration of damaged work or as waiving the right of the County to require the fulfillment of the terms of the Contract.

Each time the Contractor submits an Application for Payment, the Contractor herby certifies that each Application for Payment is complete and accurate regarding the quantities and amounts

stated in the application, and that all work for which the Contractor seeks payment have been provided in a manner that meets or exceeds the Contract's requirements.

9-1.16B SCHEDULE OF VALUES

Section 9-1.16B applies to a lump sum bid item for which a schedule of values is specified to be submitted.

The sum of the amounts for the work units listed in the schedule of values must equal the lump sum price bid for the bid item.

Obtain authorization for a schedule of values before you perform work shown on the schedule. The County does not process a progress payment for the bid item without an authorized schedule of values.

Accept progress payments for overhead, profit, bond costs, and other fixed or administrative costs as distributed proportionally among the items listed except that for a contract with a bid item for mobilization, accept progress payments for bond costs as included in the mobilization bid item.

For changed quantities of the work units listed, the County adjusts payments in the same manner as specified for changed quantities of bid items under section 9-1.06.

9-1.16C MATERIALS ON HAND

A material on hand but not incorporated into the work is not eligible for progress payment.

9-1.16D MOBILIZATION

9-1.16D(1) General

Section 9-1.16D applies if a bid item for mobilization is shown on the Bid Item List.

Payments for mobilization made under section 9-1.16D are in addition to the partial payments made under Public Contract Code § 10261.

Section 9-1.16D(2) applies unless the Contract includes a special provision for section 9-1.16D(1) that specifies section 9-1.16D(3) applies.

9-1.16D(2) Mobilization for Projects Except for Those Over Water Requiring Marine Access

The County makes partial payments for mobilization under Public Contract Code § 10264(a) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Public Contract Code § 10264(a)(5).

The County pays the item total for mobilization in excess of the maximum allowed under Public Contract Code § 10264(a)(5) in the 1st payment after Contract acceptance.

9-1.16D(3) Mobilization for Projects Over Water Requiring Marine Access

The County makes partial payments for mobilization under Public Contract Code § 10264(b) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Public Contract Code § 10264(b)(6).

The County pays the item total for mobilization in excess of the maximum allowed under Public Contract Code § 10264(b)(6) in the 1st payment after Contract acceptance.

9-1.16E WITHHOLDS

9-1.16E(1) General

The County may withhold payment for noncompliance with the Contract Documents.

The County returns the noncompliance withhold in the progress payment following correction of noncompliance except as specified in section 9-1.16E(3).

Withholds are not retainage under Public Contract Code § 7107.

Withholds are cumulative and independent of deductions.

Section 9-1.16B does not include all withholds that may be taken; the County may withhold other payments as authorized by the Contract Documents.

9-1.16E(2) Progress Withholds

The County withholds 10 percent of a progress payment for noncompliant progress. Noncompliant progress occurs when:

1. Total days to date exceed 75 percent of the working days; and
2. Percent of the working days elapsed exceeds the percent of value of the work completed by more than 15 percent

The Engineer determines the percent of the working days elapsed by dividing the total days to date by the revised Contract working days and converting the quotient to a percentage.

The Engineer determines the percent value of the work completed by summing payments made to date and the amount due on the current progress estimate, dividing this sum by the current total estimated value of the work, and converting the quotient to a percentage. These amounts are shown on the Progress Payment Voucher.

When the percent of the working days elapsed minus the percent of value of work completed is less than or equal to 15 percent, the County returns the withhold in the next progress payment.

9-1.16E(3) Performance Failure Withholds

During each estimate period you fail to comply with a Contract part, including the submittal of a document as specified, the County withholds a part of the progress payment except as specified below for the failure to submit a document during the last estimate period. These documents include QC plans, schedules, traffic control plans, and water pollution control submittals.

For 1 performance failure, the County withholds 25 percent of the progress payment but does not withhold more than 10 percent of the total bid.

For multiple performance failures, the County withholds 100 percent of the progress payment but does not withhold more than 10 percent of the total bid.

During the last estimate period, if you fail to submit a document as specified, the County withholds $10,000 for each document. The County returns the withhold within 30 days after receipt of the document.

9-1.16E(4) Stop Payment Notice Withholds and Release Bonds

The County withholds payments to cover claims filed under Civil Code § 9000 et seq.

Stop payment notice information may be obtained from County.

If at any time there shall be evidence of the existence, whether or not same has been asserted, of any mechanics lien, stop payment notice, or claim arising out of or in connection with the performance or default in performance of this Contract or any subcontract or supply contract entered into by Contractor to perform this Contract, and if the County might become liable for the discharge of or satisfaction of such mechanics lien, stop payment notice, or claim, then the County shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to discharge such mechanics lien or stop payment notice or satisfy such claim and to reimburse the County and the representatives of the County for all costs and expenses in connection therewith, including attorneys' fees. Further, the County, in its sole discretion, shall have the right to discharge or satisfy such mechanics lien, stop payment notice, or claim and pay all costs and expenses in connection therewith if the Contractor does not have such mechanics lien, stop payment notice, or claim discharged or satisfied within 10 days after receiving notice thereof from the County or unless some other procedure for discharge or satisfaction of such lien or claim is agreed upon between the County and Contractor. If the amounts retained are insufficient for the aforesaid purposes, or if such mechanics lien, stop payment notice, or claim remains undischarged or unsatisfied after all payments have been made to the Contractor, then the Contractor shall refund to the County all monies that may have been paid to discharge such lien or stop payment notice or satisfy such claims, including the costs, expenses, and attorneys' fees in connection therewith.

If the Contractor or a Subcontractor disputes the correctness or validity or enforceability of any stop payment notice, the County may, in its discretion, permit the Contractor to file with the County a bond, on a form provided by the County, executed by one or more corporate California admitted surety insurers, in an amount equal to one hundred and twenty-five percent (125%) of the claim stated in the stop payment notice conditioned for the payment of any sum which the stop payment notice claimant may recover on the claim together with its costs of suit in the action. Upon the County's acceptance of such bond, the County shall not withhold money from the Contractor on account of the stop payment notice. The surety(ies) upon the stop payment notice release bond shall be different than, and jointly and severally liable to the stop payment notice claimant with, the payment bond surety(ies).

If a Subcontractor or material supplier refuses to furnish a release or waiver required by the County, records a mechanics lien, or files a stop payment notice, the Contractor shall, upon the County's request, furnish a bond satisfactory to the County to release the stop payment notice and shall otherwise fully indemnify the County against such stop payment notice and the County shall enforce its right under the preceding paragraph.

Any lien, stop payment notice, or other claim, filed or asserted after the Contractor's acceptance of the Final Payment, by any Subcontractor, laborer, material supplier, or others, in connection with or for work performed under the Contract Documents shall be the sole and exclusive responsibility of the Contractor, who further agrees to indemnify, defend. and hold harmless the County and its board members, officers, agents and employees from and against any claims, demands, or judgment arising out of or associated therewith, including, without limitation, attorneys' fees incurred by the County in connection therewith.

9-1.16E(5) Penalty Withholds

Penalties include fines and damages that are proposed, assessed, or levied against you or the County by a governmental agency or private lawsuit. Penalties are also payments made or costs

incurred in settling alleged violations of federal, State, or local laws, regulations, requirements, or PLACs. The cost incurred may include the amount spent for mitigation or correcting a violation.

If the County is assessed a penalty, the County may withhold the penalty amount until the penalty disposition has been resolved. The County may withhold penalty amounts without notifying you.

Instead of the withhold, you may provide a bond equal to the highest estimated liability for any disputed penalties proposed except you may not provide a bond for withholds related to labor compliance violations.

9-1.16E(6)–9-1.16E(10) Reserved

9-1.16F RETENTIONS

The County will withhold 5 percent of all progress payments as retention (Public Contract Code § 7201). Unless otherwise required under applicable law, retention will be paid to you on the Final Payment.

The County will hold retainage from the Contractor and will make prompt and regular incremental acceptances of portions, as determined by the County, of the Contract work, and pay retainage to the Contractor based on these acceptances. The Contractor, or Subcontractor, shall return all monies withheld in retention from all subcontractors within 7 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the Contract work by the County. Federal law requires that any delay or postponement of payment over 30 days may take place only for good cause and with the County's prior written approval. Any violation of this provision subjects the violating Contractor or Subcontractor to the penalties, sanctions, and other remedies specified in Business and Professions Code section 7108.5 and Public Contract Code section 10262. These requirements must not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or Subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor, deficient subcontractor performance, or noncompliance by a Subcontractor.

This Contract is subject to the provisions of California Public Contract Code § 22300, a portion of which provides as follows:

> Any Contractor who elects to receive interest on moneys withheld in retention by a public agency shall, at the request of any Subcontractor, make that option available to the Subcontractor regarding any moneys withheld in retention by the Contractor from the Subcontractor. If the Contractor elects to receive any interest on any moneys by the Contractor on any retention moneys withheld from the Subcontractor by the Contractor, less any actual pro rata costs associated with administering and calculating that interest. In the event that the interest rate is a fluctuating rate, the rate for the Subcontractor shall be determined by calculating the interest rate paid during the time that retentions were withheld from the Subcontractor. If the Contractor elects to substitute securities in lieu of retention, then, by mutual consent of the Contractor and Subcontractor, the Subcontractor may substitute securities in exchange for the release of moneys held in retention by the Contractor.
>
> This subdivision shall apply only to those Subcontractors performing more than five percent of the Contractor's total Bid.
>
> No Contractor shall require any Subcontractor to waive any provision of this section.

You will have the right to substitute securities for the retention under Public Contract Code § 22300. No substitution will be accepted until:

1. The County approves the securities and their value;
2. The parties have entered into an escrow agreement (if the securities are to be held in escrow) in a form substantially similar to that under Public Contract Code § 22300; and
3. All documentation necessary for assignment of the securities to the County or to the escrow agent, are delivered in a form satisfactory to the County.

You may request the County make payment of retention earned directly to the escrow agent under subdivision (b) of Public Contract Code § 22300. The following conditions apply to the deposit of securities into escrow:

1. You will bear the cost of the County and escrow agent (either the County or the bank) in connection with the deposit.
2. Securities or certificates of deposits placed in escrow must be equivalent in value to the amount of retention to be paid you.
3. The value of the securities placed in escrow must be based on the market value of such securities as of the date the securities are deposited in escrow, and not on the face value of the securities. Such securities must be valued by the County, whose decision on valuation is final.
4. The escrow agreement must provide that the escrow agent will convert the securities deposited for cash, whole or in part, to meet the defaults by you upon unilateral demand for such conversion by the Public Works Director, and any amount so demanded must be paid to the County upon unilateral demand for payment.
5. You must be the beneficial owner of the securities substituted for moneys withheld and must receive any interest.
6. You must enter into an escrow agreement satisfactory to the County and substantially similar to Public Contract Code § 22300. You must obtain in writing consent of the surety to such agreement. The Public Works Director is authorized to sign such escrow agreements on behalf of the County.

9-1.16G RELEASE OF RETENTION

Retention shall be released in a manner consistent with Public Contract Code section 7107 and any other applicable laws. Public Contract Code section 7107(c) states the following:

(c) Within 60 days after the date of completion of the work of improvement, the retention withheld by the public entity shall be released. In the event of a dispute between the public entity and the original contractor, the public entity may withhold from the final payment an amount not to exceed 150 percent of the disputed amount. For purposes of this subdivision, "completion" means any of the following:

(1) The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or commissioning, by the public agency, or its agent, accompanied by cessation of labor on the work of improvement.

(2) The acceptance by the public agency, or its agent, of the work of improvement.

(3) After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 100 days or more, due to factors beyond the control of the contractor.

(4) After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 30 days or more if the public agency files for record a notice of cessation or a notice of completion.

9-1.16H PAYMENTS TO SUBCONTRACTORS

The Contractor shall pay each Subcontractor, no later than 7 days after receipt of payment from the County the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to their subcontractors in a similar manner. Contractor shall obtain and submit releases on County-approved forms for any payment made to Subcontractors (of any tier) and suppliers.

9-1.16I COUNTY'S RIGHT TO DISBURSE PROGRESS AND FINAL PAYMENTS BY JOINT CHECK

The County has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the County to the Contractor for subcontracted work. If the Contractor fails to furnish such evidence within 7 days, the County shall have the right to contact Subcontractors to ascertain whether they have been properly paid. The County shall not have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law. The County may, in its sole discretion, issue joint checks to the Contractor and its Subcontractors and material suppliers in satisfaction of County's obligation to make progress payments or the final payment due hereunder.

9-1.16J–9-1.16M RESERVED

9-1.17 FINAL PAYMENT

9-1.17A FINAL INSPECTION

Upon completion of the work, the Contractor shall submit written notice that the work is ready for final inspection and acceptance.

9-1.17B FINAL COMPLETION AND FINAL PAYMENT

9-1.17B(1) Affidavit of Final Completion and Final Payment

Attention is directed to Section 90-09 of the FAA General Contract Provisions. The Contractor shall, upon completion of the work and final cleaning up, submit to the County a sworn Affidavit of Final Completion on a form furnished by the Engineer. Properly submitted Claims in stated amounts may be excluded by the Contractor from the operation of the release if the Claims have not yet been resolved. Within 30 days after receipt of the Affidavit of Completion, the Engineer will inspect the work and will either (1) reject the requested Affidavit of Final Completion, specifying the defective and/or uncompleted portions of the work, or (2) accept the Affidavit of Final Completion and submit a request to the County for final acceptance of the work.

9-1.17B(2) Rejection and Revision

If the County rejects the Affidavit of Final Completion, specifying defective and/or uncompleted portions of the work, the Contractor shall promptly remedy the defective and/or uncompleted portions of the work. Thereafter, the Contractor shall give the County a revised Affidavit of Final Completion with a new date based on when the defective and/or uncompleted portions of the

work were corrected. The foregoing procedure shall apply successively thereafter until the County accepts Contractor's Affidavit of Final Completion.

9-1.17B(3) Documentation

In addition to the requirements for Final Payment set forth in the other Contract Documents, the Final Payment shall not become due until at least 30 days after: (i) Contractor has fully performed the Contract, including all punch list work; and (ii) Contractor has submitted to the County:

1. A full, complete and proper Final Application for Payment showing the proposed total amount due the Contractor, segregated as to Contract quantities, changes in the work, and other basis for payments; deductions made or to be made for prior payments; amounts to be retained; any Claims the Contractor intends to file at that time or a statement that no Claims will be filed; and any unsettled Claims, stating amounts;
2. Written consent of surety(ies) to Final Payment;
3. Contractor's written assurance that identified corrective work not complete and accepted will be completed by a stated date agreeable to the County;
4. The required As-Built Drawings (in reproducible format);
5. Reasonable proof that taxes, fees and similar obligations of Contractor have been paid;
6. Documentation that Contractor has inspected, tested, and adjusted performance of every system or facility of the work to ensure that overall performance is in compliance with terms of the Contract Documents;
7. Reasonable proof that Contractor has discontinued and removed temporary facilities and services from the Site, along with construction tools and facilities, forms, and similar items except for Contractor's field office;
8. Reasonable proof that Contractor has provided instruction for the County's operating personnel on systems and equipment operational requirements;
9. A report on performance of completed installations after adjustment that appear unable to comply with the requirements of the Contract Documents;
10. The operating manuals for operating and maintaining the work; and
11. Four (4) copies of all warranties from vendors and Subcontractors, operation and maintenance manuals, instructions and related agreements, equipment certifications and similar documents, and maintenance and operating instructions.

The Engineer reserves the right to not require any of the above submittals which the Engineer determines, in his/her sole discretion, is not applicable to a particular project.

9-1.17B(4) Disbursement of Final Payment

Pursuant to California Public Contract Code section 7107, if there is any dispute between the County and the Contractor at the time that disbursement of the Final Payment is due, the County may withhold from disbursement of the Final Payment an amount not to exceed one hundred fifty percent (150%) of the amount in dispute.

9-1.17B(5) No Waiver of Claims by County

The making of Final Payment shall not constitute a waiver of any Claims by the County including, but not limited to:

1. unsettled stop payment notices;
2. faulty or defective work;
3. failure of the work to comply with the requirements of the Contract Documents;
4. terms of special warranties required by the Contract Documents; or

5. any other cause, unless specifically waived by the County in writing.

9-1.17B(6) Waiver of Claims by Contractor, Subcontractors, and Suppliers

Acceptance of final payment by the Contractor, a Subcontractor, or a material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

TECHNICAL PROVISIONS

FOR

AIRPORTS - SLO - OUTBOUND BAGGAGE IMPROVEMENTS, PTN12
CONTRACT NO. 330046

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STANDARD SPECIFICATIONS

SPECIAL PROVISIONS

SLO COUNTY AIRPORT

Baggage Screening System

Bid Opening: July 23, 2026, at 3:15 p.m.

AIP No. 3-06-0228-066-2026

SPECIFICATIONS

Prepared for

SLO COUNTY AIRPORT

975 Airport Drive
San Luis Obispo, CA 93401

Prepared by

3110 East Guasti Rd. Ste 330
Ontario, CA 91710

June 2026

Bid Set

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DIVISION II

FEDERAL CONTRACT PROVISIONS

Federal Contract Provisions
for Airport Improvement Program (AIP) Projects

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CONTRACT GUIDANCE

a) Federal laws and regulations require that a Sponsor (a recipient of federal assistance) include specific clauses in certain contracts, solicitations, or specifications regardless of whether or not the project is federally funded.

b) For purposes of remaining compliant with its obligations, a Sponsor must incorporate applicable contract provisions in all its procurements and contract documents. Unless otherwise stated, these provisions flow down to subcontracts and sub-tier agreements.

d) Require the contractor (including all subcontractors) to insert these contract provisions in each lower tier contract (e.g., subcontract or sub-agreement).

e) Require the contractor (including all subcontractors) to incorporate the requirements of these contract provisions by reference for work done under any purchase orders, rental agreements, and other agreements for supplies or services.

f) Require that the prime contractor be responsible for compliance with these contract provisions by any subcontractor, lower-tier subcontractor, or service provider.

g) Verify that any required local or State provision does not conflict with or alter a Federal law or regulation.

A1 ACCESS TO RECORDS AND REPORTS

SOURCE: 2 CFR § 200.334, 2 CFR § 200.337, FAA Order 5100.38

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Aviation Administration and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

A2 BREACH OF CONTRACT TERMS

SOURCE: 2 CFR Part 200, Appendix II(A)

Any violation or breach of terms of this contract on the part of the Contractor or its subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement.

Owner will provide Contractor written notice that describes the nature of the breach and corrective actions the Contractor must undertake in order to avoid termination of the contract. Owner reserves the right to withhold payments to Contractor until such time the Contractor corrects the breach or the Owner elects to terminate the contract. The Owner's notice will identify a specific date by which the Contractor must correct the breach. Owner may proceed with termination of the contract if the Contractor fails to correct the breach by the deadline indicated in the Owner's notice.

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

A3 BUY AMERICAN PREFERENCE

SOURCE: Title 49 U.S.C. § 50101; Executive Order 14005, Ensuring the Future is Made in All of America by All of America's Workers; Infrastructure Investment and Jobs Act (IIJA) (P.L. No. 117-58), Build America, Buy America (BABA)

The Contractor certifies that its bid/offer is in compliance with 49 U.S.C. § 50101, BABA and other related Made in America Laws,[1] U.S. statutes, guidance, and FAA policies, which provide that Federal funds may not be obligated unless all iron, steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

The bidder or offeror must complete and submit the certification of compliance with FAA's Buy American Preference, BABA and Made in America laws included herein with their bid or offer. **The Airport Sponsor/Owner will reject as nonresponsive** any bid or offer that does not include a completed certification of compliance with FAA's Buy American Preference and BABA.

[1] Per Executive Order 14005 "Made in America Laws" means all statutes, regulations, rules, and Executive Orders relating to federal financial assistance awards or federal procurement, including those that refer to "Buy America" or "Buy American," that require, or provide a preference for, the purchase or acquisition of goods, products, or materials produced in the United States, including iron, steel, and manufactured products offered in the United States.

(See Proposal Forms for Required Certifications)

The bidder or offeror certifies that all constructions materials, defined to mean an article, material, or supply other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives that are or consist primarily of: non-ferrous metals; plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); glass (including optic glass); lumber; or drywall used in the project are manufactured in the U.S.

The bidder or offeror certifies procurement of certain rolling stock using FAA grant funds will prohibit airports from using Federal financial assistance to procure buses or rail car vehicle rolling stock from covered entities.

A4 CIVIL RIGHTS - GENERAL

49 U.S.C. § 47123

GENERAL CIVIL RIGHTS PROVISIONS

In all its activities within the scope of its airport program, the Contractor agrees to comply with pertinent statutes, Executive Orders, and such rules as identified in Title VI List of Pertinent Nondiscrimination Acts and Authorities to ensure that no person shall, on the grounds of race, color, national origin, creed, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

The above provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract.

A5 CIVIL RIGHTS – TITLE VI ASSURANCE

49 U.S.C. § 47123; FAA Order 1400.11;

Title VI Solicitation Notice:

The County of San Luis Obispo in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4), 28 CFR § 50.3, and 49 CFR Part 21, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, all contractors will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of the owner's race, color, national origin, sex, creed, age, or disability in consideration for an award.

Title VI List of Pertinent Nondiscrimination Acts and Authorities

(Insert this list in every contract or agreement.)

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq*., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR Part 21 (Non-discrimination in Federally-Assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964) including amendments thereto;

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq*.), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27 (Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance);
- The Age Discrimination Act of 1975, as amended (42 .U.S.C. § 6101 *et seq*.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (P.L. 100-259) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990 (42 U.S.C. § 12101, et seq) (prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities) as implemented by U.S. Department of Transportation regulations at 49 CFR Parts 37 and 38;
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681, et seq).

Compliance with Nondiscrimination Requirements:

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor"), agrees as follows:

1. **Compliance with Regulations:** The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin), creed, sex, age, or disability in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21 including amendments thereto.
3. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the contractor's obligations under this contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.

4. **Information and Reports:** The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance: In** the event of a Contractor's noncompliance with the non-discrimination provisions of this contract, the Sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

    a. Withholding payments to the Contractor under the contract until the Contractor complies; and/or

    b. Cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Sponsor to enter into any litigation to protect the interests of the Sponsor. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

A6 CLEAN AIR AND WATER POLLUTION CONTROL

2 CFR Part 200, Appendix II(G); 42 U.S.C. § 7401, et seq; 33 U.S.C. § 1251, et seq

(Contractor must include this requirement in all subcontracts that exceed $150,000.)

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. §§ 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. §§ 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration.

A7 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

2 CFR Part 200, Appendix II(E); 29 CFR § 5.5(b)(2); 29 CFR 5.8(a); 40 U.S.C. § 3702(c)

Contract Work Hours and Safety Standards Act Requirements (CWHSSA) (40 U.S.C. §§ 3702 & 3704) requires contractors and subcontractors on covered contracts to pay laborers and mechanics employed in the performance of the contracts not less than one and one-half times their basic rate of pay for all hours worked over 40 in a workweek. CWHSSA prohibits unsanitary, hazardous, or dangerous working conditions on federally-assisted projects. The Wage and Hour Division (WHD) within the U.S. Department of Labor (DOL) enforces the compensation requirements of this Act, while DOL's Occupational Safety and Health Administration (OSHA) enforces the safety and health requirements.

CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

1. Overtime Requirements.

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph (1) of this clause, the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of $33 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.

3. Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this clause.

4. Subcontractors.

The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

A8 COPELAND "ANTI-KICKBACK" ACT

SOURCE: 2 CFR Part 200, Appendix II(D); 29 CFR Parts 3 and 5

COPELAND "ANTI-KICKBACK" ACT

Contractor must comply with the requirements of the Copeland "Anti-Kickback" Act (18 USC 874 and 40 USC 3145), as supplemented by Department of Labor regulation 29 CFR part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each Subcontractor must submit to the Owner, a weekly statement on the wages paid to each employee performing on covered work during the prior week. Owner must report any violations of the Act to the Federal Aviation Administration.

A9 DAVIS-BACON REQUIREMENTS

SOURCE 2 CFR Part 200, Appendix II(D); 29 CFR Part 5; 49 USC § 47112(b); 40 USC §§ 3141-3144, 3146, and 3147

The Davis-Bacon Act (40 USC §§ 3141-3144, 3146, and 3147) ensures that laborers and mechanics employed under the contract receive pay no less than the locally prevailing wages and fringe benefits as determined by the Department of Labor.

DAVIS-BACON REQUIREMENTS

1. Minimum Wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under regulations implementing the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination;

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers, or mechanics to be employed in the classification, or their representatives, and the contracting officer do not agree on the proposed classification and wage rate

(including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding. The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Federal Aviation Administration may, after written notice to the Contractor, Sponsor, Applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and Basic Records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records that show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR § 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall only need to include an individually identifying number for each employee (*e.g.,* the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at *https://www.dol.gov/agencies/whd/government-contracts/construction/payroll-certification* or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit them to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, Sponsor, or Owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i), and that such information is correct and complete;

(2) That each laborer and mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Sponsor, the Federal Aviation Administration, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, Sponsor, applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the

required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR § 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR § 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at no less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination that provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the

work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

5. Compliance with Copeland Act Requirements.

The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

6. Subcontracts.

The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR §§ 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR § 5.5.

7. Contract Termination: Debarment.

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR § 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes Concerning Labor Standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of Eligibility.

(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR § 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR § 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 USC § 1001.

A10 DEBARMENT AND SUSPENSION

SOURCE 2 CFR Part 180 (Subpart B); 2 CFR Part 200, Appendix II(H); 2 CFR Part 1200; DOT Order 4200.5; Executive Orders 12549 and 12689

CERTIFICATION OF OFFEROR/BIDDER REGARDING DEBARMENT

By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

CERTIFICATION OF LOWER TIER CONTRACTORS REGARDING DEBARMENT

The successful bidder, by administering each lower tier subcontract that exceeds $25,000 as a "covered transaction", must confirm each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally-assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: http://www.sam.gov.
2. Collecting a certification statement similar to the Certification of Offeror /Bidder Regarding Debarment, above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the Federal Aviation Administration later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

A11 DISADVANTAGED BUSINESS ENTERPRISE

SOURCE: 49 CFR Part 26; 49 U.S.C. § 47113

REQUIRED PROVISIONS

Bid Information submitted as a matter of **responsibility**:

The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR § 26.53.

As a condition of responsibility, every Bidder or Offeror must submit the following information on the forms provided herein within five days after bid opening.

1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
2) A description of the work that each DBE firm will perform;
3) The dollar amount of the participation of each DBE firm listed under (1);
4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal;
5) Written confirmation from each listed DBE firm that it is participating in the contract in the kind and amount of work provided in the prime contractor's commitment; and
6) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR Part 26 including any amendments thereto. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

Prime Contracts (Contracts Covered by a DBE Program)

Contract Assurance (49 CFR § 26.13)

The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26, including any amendments thereto, in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract,

which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

1) Withholding monthly progress payments;
2) Assessing sanctions;
3) Liquidated damages; and/or
4) Disqualifying the Contractor from future bidding as non-responsible.

Prompt Payment (49 CFR § 26.29)

The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than THIRTY (30) days from the receipt of each payment the prime contractor receives from COUNTY OF SAN LUIS OBISPO. The prime contractor agrees further to return retainage payments to each subcontractor within THIRTY (30) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the COUNTY OF SAN LUIS OBISPO . This clause applies to both DBE and non-DBE subcontractors.

Termination of DBE Subcontracts (49 CFR § 26.53(f))

The prime contractor must not terminate a DBE subcontractor listed in response to this project's Notice to Bidder's / Bid Advertisement (or an approved substitute DBE firm) without prior written consent of COUNTY OF SAN LUIS OBISPO . This includes, but is not limited to, instances in which the prime contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

The prime contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains written consent COUNTY OF SAN LUIS OBISPO . Unless COUNTY OF SAN LUIS OBISPO consent is provided, the prime contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

COUNTY OF SAN LUIS OBISPO may provide such written consent only if COUNTY OF SAN LUIS OBISPO agrees, for reasons stated in the concurrence document, that the prime contractor has good cause to terminate the DBE firm. For purposes of this paragraph, good cause includes the circumstances listed in 49 CFR § 26.53.

Before transmitting to COUNTY OF SAN LUIS OBISPO its request to terminate and/or substitute a DBE subcontractor, the prime contractor must give notice in writing to the DBE subcontractor, with a copy to COUNTY OF SAN LUIS OBISPO , of its intent to request to terminate and/or substitute, and the reason for the The prime contractor must give the DBE five days to respond to the prime contractor's notice and advise [Name of Recipient] and the contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why COUNTY OF SAN LUIS OBISPO should not approve the prime contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), COUNTY OF SAN LUIS OBISPO may provide a response period shorter than five days.

In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE firms put forward by offerors in negotiated procurements.

A12 DISTRACTED DRIVING

SOURCE: Executive Order 13513; DOT Order 3902.10SOURCE

TEXTING WHEN DRIVING

In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving", (10/1/2009) and DOT Order 3902.10, "Text Messaging While Driving", (12/30/2009), the Federal Aviation Administration encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or subgrant.

In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with the project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding $15,000 that involve driving a motor vehicle in performance of work activities associated with the project.

A13 PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

SOURCE 2 CFR § 200, Appendix II(K); 2 CFR § 200.216

Sponsors and subgrant recipients are prohibited from using AIP grant funds to:

a) Procure or obtain,
b) Extend or renew a contract to procure or obtain, or
c) Enter into a contract to procure or obtain certain covered telecommunications equipment.

These restrictions apply to telecommunication equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system or as critical technology as part of any system. Covered telecommunications equipment is equipment produced or provided by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of either).

Include the following provision in all AIP funded contracts and lower-tier contracts.

PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

Contractor and Subcontractor agree to comply with mandatory standards and policies relating to use and procurement of certain telecommunications and video surveillance services or equipment in compliance with the National Defense Authorization Act P.L. 115-232, § 889(f)(1)).

A14 DRUG FREE WORKPLACE REQUIREMENTS

SOURCE 49 CFR Part 32 Drug-Free Workplace Act of 1988 (41 U.S.C. § 8101-8106, as amended)

No mandatory or recommended text provided because the requirements do not extend beyond the Sponsor level.

A15 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

SOURCE 29 USC § 201, et seq 2 CFR § 200.430

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR Part 201, et seq, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers.

The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

A16 LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

SOURCE: 31 USC § 1352 – Byrd Anti-Lobbying Amendment; 2 CFR Part 200, Appendix II(I) 49 CFR Part 20, Appendix A

CERTIFICATION REGARDING LOBBYING

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

A17 OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

SOURCE: 29 CFR Part 1910

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (29 CFR Part 1910). The employer must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

A18 PROCUREMENT OF RECOVERED MATERIALS

SOURCE: 2 CFR § 200.323; 2 CFR Part 200, Appendix II(J); 40 CFR Part 247; 42 USC § 6901, et seq (Resource Conservation and Recovery Act (RCRA))

Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247. In the performance of this contract and to the extent practicable, the Contractor and subcontractors

are to use products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

1) The contract requires procurement of $10,000 or more of a designated item during the fiscal year; or
2) The contractor has procured $10,000 or more of a designated item using Federal funding during the previous fiscal year.

The list of EPA-designated items is available at www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products.

Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the contractor can demonstrate the item is:

a) Not reasonably available within a timeframe providing for compliance with the contract performance schedule;
b) Fails to meet reasonable contract performance requirements; or
c) Is only available at an unreasonable price.

A19 RIGHT TO INVENTIONS

SOURCE: 2 CFR Part 200, Appendix II(F); 37 CFR Part 401

Not Applicable

A20 SEISMIC SAFETY

SOURCE: 49 CFR Part 41

SEISMIC SAFETY

The Contractor agrees to ensure that all work performed under this contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.

A21 TAX DELINQUENCY AND FELONY CONVICTIONS

SOURCE: Section 8113 of the Consolidated Appropriations Act, 2022 (P.L. 117-103) and similar provisions in subsequent appropriations acts. DOT Order 4200.6 – Appropriations Act Requirements for Procurement and Non-Procurement Regarding Tax Delinquency and Felony Convictions

CERTIFICATION OF OFFEROR/BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (ü) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications – ***this certification is included in the proposal forms to be submitted with bid.***

1) The applicant represents that it is (ü) is not (ü) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2) The applicant represents that it is (ü) is not (ü) a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the Sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. Code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 USC § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

A22 TERMINATION OF CONTRACT

SOURCE: 2 CFR Part 200, Appendix II(B) FAA Advisory Circular 150/5370-10, Section 80-09

TERMINATION FOR CONVENIENCE (CONSTRUCTION & EQUIPMENT CONTRACTS)

The Owner may terminate this contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of Owner. Upon receipt of a written notice of termination, except as explicitly directed by the Owner, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts due under this clause:

1. Contractor must immediately discontinue work as specified in the written notice.
2. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
3. Discontinue orders for materials and services except as directed by the written notice.
4. Deliver to the Owner all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment and materials acquired prior to termination of the work, and as directed in the written notice.
5. Complete performance of the work not terminated by the notice.
6. Take action as directed by the Owner to protect and preserve property and work related to this contract that Owner will take possession.

Owner agrees to pay Contractor for:

1. Completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination;
2. Documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;

3. Reasonable and substantiated claims, costs, and damages incurred in settlement of terminated contracts with Subcontractors and Suppliers; and
4. Reasonable and substantiated expenses to the Contractor directly attributable to Owner's termination action.

Owner will not pay Contractor for loss of anticipated profits or revenue or other economic loss arising out of or resulting from the Owner's termination action.

The rights and remedies this clause provides are in addition to any other rights and remedies provided by law or under this contract.

TERMINATION FOR CAUSE (CONSTRUCTION)

Section 80-09 of FAA Advisory Circular 150/5370-10 establishes standard language for conditions, rights, and remedies associated with Owner termination of this contract for cause due to default of the Contractor.

TERMINATION FOR CAUSE (EQUIPMENT)

The Owner may, by written notice of default to the Contractor, terminate all or part of this Contract for cause if the Contractor:

1. Fails to begin the Work under the Contract within the time specified in the Notice- to-Proceed;
2. Fails to make adequate progress as to endanger performance of this Contract in accordance with its terms;
3. Fails to make delivery of the equipment within the time specified in the Contract, including any Owner approved extensions;
4. Fails to comply with material provisions of the Contract;
5. Submits certifications made under the Contract and as part of their proposal that include false or fraudulent statements; or
6. Becomes insolvent or declares bankruptcy.

If one or more of the stated events occur, the Owner will give notice in writing to the Contractor and Surety of its intent to terminate the contract for cause. At the Owner's discretion, the notice may allow the Contractor and Surety an opportunity to cure the breach or default.

If within [10] days of the receipt of notice, the Contractor or Surety fails to remedy the breach or default to the satisfaction of the Owner, the Owner has authority to acquire equipment by other procurement action. The Contractor will be liable to the Owner for any excess costs the Owner incurs for acquiring such similar equipment.

Payment for completed equipment delivered to and accepted by the Owner shall be at the Contract price. The Owner may withhold from amounts otherwise due the Contractor for such completed equipment, such sum as the Owner determines to be necessary to protect the Owner against loss because of Contractor default.

Owner will not terminate the Contractor's right to proceed with the work under this clause if the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such acceptable causes include: acts of God, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, and severe weather events that substantially exceed normal conditions for the location.

If, after termination of the Contractor's right to proceed, the Owner determines that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the Owner issued the termination for the convenience the Owner.

The rights and remedies of the Owner in this clause are in addition to any other rights and remedies provided by law or under this contract.

A23 TRADE RESTRICTION CERTIFICATION

SOURCE: 49 USC § 50104; 49 CFR Part 30

TRADE RESTRICTION CERTIFICATION

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror –

1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);
2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the USTR; and
3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 USC § 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR § 30.17, no contract shall be awarded to an Offeror or subcontractor:

1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR; or
2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list; or
3) who incorporates in the public works project any product of a foreign country on such USTR list.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration (FAA) may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

A24 VETERAN'S PREFERENCE

SOURCE: 49 USC § 47112(c)

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within 49 U.S.C. § 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 U.S.C. § 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

A25 DOMESTIC PREFERENCES FOR PROCUREMENTS

SOURCE: 2 CFR § 200.322; 2 CFR Part 200, Appendix II(L)

Must be included in all subawards, including all contracts and purchase orders for work or products under the grant.

CERTIFICATION REGARDING DOMESTIC PREFERENCES FOR PROCUREMENTS

The Bidder or Offeror certifies by signing and submitting this bid or proposal that, to the greatest extent practicable, the Bidder or Offeror has provided a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including, but not limited to, iron, aluminum, steel, cement, and other manufactured products) in compliance with 2 CFR § 200.322.

A26 PROHIBITION OF COVERED UNMANNED AIRCRAFT SYSTEMS (UAS)

SOURCE: FAA Reauthorization Act of 2024 (Public Law 118-63), Section 936; 49 U.S.C. § 44801 note

Sponsors and subgrant recipients are prohibited from using AIP grant funds to enter into, extend, or renew a contract for:

1) *The operation, procurement, or contracting action with respect to a covered unmanned aircraft system (UAS); or*
2) *To any entity that operates a covered unmanned aircraft system (UAS) in the performance of such contract.*

The term "Covered UAS" means a small unmanned aircraft, an unmanned aircraft, and unmanned aircraft system, or the associated elements of such aircraft and aircraft systems related to the collection and transmission of sensitive information (consisting of communication links and the components that control the unmanned aircraft) that enable the operator to operate the aircraft in the National Airspace System which is manufactured or assembled by a covered foreign entity; and an unmanned aircraft detection system or counter- UAS system that is manufactured or assembled by a covered foreign entity. These covered foreign entities include:

(a) The People's Republic of China.

(b) The Russian Federation.

(c) The Islamic Republic of Iran.

(d) The Democratic People's Republic of Korea.

(e) The Bolivarian Republic of Venezuela.

(f) The Republic of Cuba.

(g) Any other country the Secretary determines necessary.

Include the following provision in all AIP-funded contracts and lower-tier contracts:

The Bidder or Offeror certifies that they are aware of and comply with relevant Federal statutes and regulations, including those from the Federal Aviation Administration (FAA), for operating unmanned

aircraft systems (UAS) in accordance, and in compliance with all related requirements in the FAA Reauthorization Act of 2024 (Public Law 118-63), section 936 (49 U.S.C. § 44801 note).

Contractor warrants that all UAS operations will be conducted in full compliance with all applicable Federal Aviation Administration (FAA) regulations, including but not limited to 14 CFR Part 107, and any other applicable local, state, or Federal laws and regulations.

Sponsors and subgrant recipients cannot use AIP grant funds to enter into, extend, or renew a contract related to covered unmanned aircraft systems (UAS). This includes both procurement and operational contracts, as well as contracts with entities that operate such systems.

END OF FEDERAL CONTRACT PROVISIONS

DIVISION III

Project-specific Requirements for Airport Construction

DIVISION III - PART 1

Special Provisions for Airport Construction

Item SP-100 Special Provisions for Airport Construction

DESCRIPTION

SP-100-1.1 Overview. This Section provides for construction safety in an Airport environment; limitations on construction operations; minimum requirements for construction management and scheduling; and site-specific information pertaining to potential impacts on construction activities. Unless otherwise noted, all costs associated with related work shall be included in the Contract pay item for Airfield Safety and Traffic Control.

SP-100-1.2 Construction Safety and Phasing Plan (CSPP). A Construction Safety and Phasing Plan has been prepared for this project and is included as Part 2 of "Project-Specific Requirements for Airport Construction." Contractor shall comply with the CSPP. Included as part of the requirements of the CSPP is the Safety Plan Compliance Document (SPCD) to be completed by the Contractor.

SP-100-1.3 Security Access / Badging. The Contractor shall be responsible for obtaining Airport Operations Area (AOA) security badges for supervisory and any other necessary construction personnel from the Airport Administration Office. All contractor and subcontractor personnel requiring access to the AOA, where jobsite is located and work is to be performed, will be required to apply/receive an AOA badge prior to entering jobsite unescorted. See *Exhibit C – How to Apply for an AOA Badge*. The security badge requirements and any costs shall be included in the bid item for Airfield Safety and Traffic Control. SLO County Airport does not charge a badging fee for Contractor personnel.

Badged personnel are limited to escorting no more than three (3) persons who will remain within visual and hearing distance of the badged person. The badged contractor, with escort authority, must also ensure that the persons being escorted do not engage in any activity outside those activities for which access was granted. All construction personnel, including those with an AOA badge, shall always remain within the construction limits unless written authorization is provided by the Airport Manager.

The Contractor shall ensure adequate personnel are badged at all times throughout the Project. Badges expire after one (1) year from the date of issuance by the Airport. Additional processing charges apply for reissuing expired badges.

The Contractor shall provide administrative support to the Airport during badge processing. Administrative support includes filing out applications, coordinating security screening meetings at the Airport, collection personnel identification, and data input.

Badging appointments are mandatory and can be made through the Airport's Administrative Office. All security badges shall be logged and returned to the Airport upon completion of work or portions of work, or upon demand from the Airport.

SP-100-1.4 Construction Schedule and Progress Schedule. A construction schedule and progress schedule shall be submitted to the Resident Project Representative (RPR) by the Contractor within five (5) working days prior to the preconstruction meeting. A County-approved schedule will be required prior to issuing a Notice to Proceed with the Construction Element.

The Schedule shall be a Critical Path Method Baseline type. Schedule shall indicate complete sequence of each construction category, indicating a time bar for each major category or unit of work to be performed. Work shall be properly sequenced and indicate being fully completed within the scheduled time of

completion or substantial completion. The schedule shall also include manpower, equipment utilization and resource needs (resource loading) to meet the schedule.

Schedule shall be coordinated with all other Contractors, subcontractors and material suppliers prior to submission. Contractor shall update the schedule for each weekly construction progress meeting or whenever there is a significant change in progress, whether in a particular phase or total job progress.

Progress schedule shall incorporate, submittals, product data, and sample submissions. Schedule shall indicate preparation time, approval time, resubmissions, fabrications, delivery dates and installation time.

SP-100-1.5 Certified Payroll Requirements (CPR) - (State of California) ***(See Attachment 1 for detailed information on CPR Requirements.)***

Contractor must comply with the provisions of Labor Code §§ 1776 and 1812 and all implementing regulations, which are fully incorporated by this reference, including requirements for electronic submission of payroll records to the DIR. (Refer to General Conditions Article 9.4 for further information.)

- **Fringe Benefits Statement**
  - All Fringe Benefits Statements must include the fringes for every job classification, group number, and step number for journeyman and apprentices to whom payroll is being provided on the job.
  - They must be signed by the payroll administrator. If for any reason an employee / employer is exempt, it must be explained as to why a Fringe is not being provided or indicated on the Fringe itself, such as "Owner/Operator" or legal exemption status provided.
  - Verify that the correct naming convention for the project is included, along with appropriate 'week ending' weeks worked.
- **Certified Payroll Wage Hour Report**
  - All certified payroll must clearly indicate whether an individual is a journeyman or apprentice and include all vital information for verification i.e., work classification; group number or step number; hours worked; and base pay rate for straight time, overtime, and double-time. Per contractual obligation, all individuals will be paid per the California prevailing wage rate, as these rates take precedence over the Davis-Bacon Act pay rates and union pay scales (the highest wage rate prevails).
  - If an individual did not perform any physical labor, but provided supervision over others only, indicate on the payroll itself, as these individuals are exempt from certified payroll.
  - Payroll shall be submitted weekly or bi-weekly (based on existing pay periods) to the Department of Industrial Relations (DIR) (Director's General Prevailing Wage Determinations (ca.gov) once provided with a DIR reporting number and work has begun on the project.
  - All consecutive weeks of either payroll or non-performance weeks must be accounted for. The final report must be identified as such by the contractor or subcontractor's payroll administrator.
  - All changes to previously submitted payroll must be resubmitted if any errors or omissions have been noted and all changes to previously submitted payroll indicated.
- **Statement of Compliance**
  - Each week of work performed shall be accompanied by a signed and dated Statement of Compliance (page 2 of the Dol WHD WH-347 form). All appropriate boxes shall be checked and all notes regarding any payroll payment exceptions are to be recorded on this form.
  - Verify that the correct naming convention for the project is included, along with documentation of the appropriate 'work week' indicated.
- **Non-Performance Weeks**

- Each consecutive week in which no work was performed on the project site must be documented with a signed Statement of Non-Performance and/or Statement of Compliance.
- Extended/consecutive periods of non-performance weeks may be submitted on a single signed certified payroll form, with weekly DIR receipts (eCPR) provided as proof of submittal. If payroll is not required to be submitted to the DIR, a signed Statement of Non-Performance must still be provided to cover all non-working weeks until a final is presented.

- **eCPR**
  - Contractor and their subcontractors will submit certified payroll reports (weekly or bi-weekly) to the DIR and an eCPR receipt will be generated to the payroll administrator upon submittal. (NOTE: these are only available when the payroll is initially submitted and are not retrievable after initial receipt from the DIR's website.)
  - eCPR shall be submitted along with its corresponding weekly (or bi-weekly) certified payroll report (both working and non-performance weeks) and corresponding signed Statement of Compliance or Non-performance for verification purposes.
  - **Pre-activity Conference**
    - Contractor shall be required to attend the Pre-activity Conference for Certified Payroll / Davis-Bacon and Related Acts Compliance.
    - The conference is anticipated to be approximately one hour in length and shall be attended virtually.
    - The following sources are available for supplemental certified payroll training, instruction, and processing:
      - Prevailing Wage Seminars | U.S. Department of Labor (dol.gov)
      - SAM.gov | Wage Determinations
        - Continue search under Wage Determinations / Public Buildings or Works / Construction.
        - Search by state, e.g., Arizona or California; County; DBA Construction Type; and Published Date.
      - Director's General Prevailing Wage Determinations (ca.gov) – State of California Department of Industrial Relations
        - Continue search under Director's General Prevailing Wage Determinations for current year, journeyman and apprentice determinations menus, and superseded prevailing wage determinations.
      - Prevailing Wage Resource Book May 2015 | U.S. Department of Labor (dol.gov)
      - DBA/DBRA Compliance Principles (dol.gov)

- **Questions**
  - The prime contractor is the first contact for all questions related to certified payroll reporting.
  - Second point of contact for questions will be provided to Contractor upon execution of award / contract.

SP-100-1.6 Lines and Grades. The Contractor shall provide construction and layout staking in accordance with the requirements of these Specifications. The Contractor shall protect and preserve all marks set by others and shall be liable for replacement of marks destroyed during construction. The RPR shall be given 48 hours' notice of subgrade, and aggregate base completion, building foundation, and pavement markings so finished grades and layout may be checked. The Contractor shall include the associated costs in the Contract item for Construction Staking and Survey Layout.

SP-100-1.7 Record Drawings. The Contractor shall maintain Record Drawings of all work continuously as the job progresses. It shall be required that these Drawings be up to date and be reviewed by the Resident Project Representative (RPR) at the time each progress bill is submitted. Documentation of Record Drawings shall be included in other items of work and no separate payment will be made.

A. The Contractor shall maintain one record set of Drawings at the Site. On these, it shall mark all Project conditions, locations, configurations, and any other changes or deviations which may vary from the information represented in the original Contract Documents, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to fully indicate the Work as actually constructed. These master record drawings of the as-built conditions, including all revisions made necessary by Addenda and Change Orders shall be maintained up-to-date during the progress of the Project. Red ink shall be used for alterations and notes. Notes shall identify relevant Change Orders by number and date.

B. For all Projects involving the installation of any pipeline, Contractor shall survey and record the top of the pipe at a minimum of every 100 linear feet, and at each bend, recording both the horizontal and vertical locations.

C. Record drawings shall be accessible to the RPR at all times during the construction period.

D. Upon Completion of the Project and as a condition of final acceptance, the Contractor shall finalize and deliver a complete set of Record Drawings to the RPR. The information submitted by the Contractor will be assumed to be correct, and the Contractor shall be responsible for, and liable to County, for the accuracy of such information, and for any errors or omissions which may or may not appear on the Record Drawings.

SP-100-1.8 Material Testing and Retesting. All Quality Control and materials testing shall be performed by the Contractor in accordance with C-100 CQCP. The Contractor will be required to inform the RPR of the materials testing scheduled and submit reports to the RPR for review of test results and frequency of tests in conformance with Contract Documents. The RPR, at their discretion, may elect to perform additional acceptance tests as deemed necessary or as required. Acceptance testing will be performed by the RPR as detailed in these Specifications. The Quality Control Testing shall include, but is not limited to:

A. Compaction testing for soils, aggregates, and pavements prior to acceptance testing by RPR, if required.

B. Mat density and air voids, stability and flow, and joint density testing for pavement.

C. Concrete strength mix design and other conformance testing required for structural Portland cement concrete.

D. Electrical grounding and circuit testing.

The Contractor is allotted one acceptance test per area per material per lot. In the event the acceptance tests do not pass and the RPR is required to retest the area, the cost for each retest shall be borne by the Contractor at the actual cost plus a 25% markup.

SP-100-1.9 Construction Staking and Survey Layout. The Contractor shall provide the surveying and staking as necessary to meet the requirements of the Contract Documents. The initial survey layout shall be performed by a Registered Land Surveyor and layout reconfirmed prior to paving. Project Plans

indicate elevations at points of paving and grading joins and daylights. Contractor shall verify existing elevations and advise the RPR of any discrepancies (in excess of 0.03' in paved areas and 0.06' in unpaved areas) three (3) working days in advance of critical path work to determine if and design modifications are warranted. Any costs for rework required due to existing grade discrepancies not brought to the RPR's attention shall be borne by the Contractor.

SP-100-1.10 Schedule of Values. A schedule of value(s) shall be provided for each lump sum bid item within 5 days of request, but not later than 10 working days before the first progress payment. The schedule of values shall be in the form of a detailed, itemized cost breakdown of the lump sum amount that includes the profit and overhead costs for each item including a line-by-line breakdown of labor and materials. All work to be performed by subcontractors shall be listed. The schedule of values, once established, will serve as the basis for estimating or evaluating the percentage of lump sum work completed for progress payments. Progress payments on Unit Price Work will be based on the number of units completed. The schedule of values may also be used to evaluate the impact of unbalanced pricing.

SP-100-1.11 Submittals. All materials and equipment used to construct this work shall be submitted to the RPR for approval prior to ordering the equipment.

The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the Drawings and Contract Documents. The RPR reserves the right to reject any and all equipment, materials or procedures, which, in the RPR's opinion, do not meet the system design and the standards and codes specified.

For items listed under 'a.' below – the Contractor shall provide the submittals at least five (5) working days prior to the pre-construction meeting. Issuance of a Notice to Proceed is dependent on the timelines and the proper level of detail of these submittals. Submittals shall be submitted to the Engineer electronically.

Submittals shall include items as detailed in *Supplemental Documents, Item 1, Contractor's Materials and Equipment Submittal Checklist*, and below, but are not limited to:

a. General Requirements
Key Personnel, Telephone Numbers, and Emergency Telephone Numbers
Project Construction Schedule (CPM)

b. Site Work- including but not limited to *Supplemental Documents, Item 1 Contractor's Materials and Equipment Submittal Checklist*

Manufacturer's catalogs (or excerpts thereof) and affidavits of compliance with the Contract Documents shall be submitted for all materials to be used on the project. Alternate products may be approved by the Engineer upon submittal of the following information and subject to the acceptance of the FAA.

The County will not consider an alternate product that does not have adequate demonstrated experience and meet all performance requirements of this specification.

Contractor shall allow a minimum of ten (10) working days for evaluation of requests for substitution or deviation from the Contract Documents.

SP-100-1.12 Submittal Procedures.

a. Submit electronic submittals via email as PDF electronic files, whenever possible. If not submitting electronically, submit six (6) paper copies of each submittal, unless otherwise indicated.

b. Each submittal item shall be individually numbered according to the *Contractor's Materials and Equipment Submittal Checklist*, so that approved and rejected submittals can be tracked.

c. Edit submittals so that the submittal specifically applies to only the equipment furnished. Neatly cross out all extraneous text, options, models, etc. that do not apply to the equipment being furnished, so that the information remaining is only applicable to the equipment furnished.

d. Present measurements in customary American units (feet, inches, pounds, etc.).

e. After the initial submittal package, a separate transmittal form shall be used for each subsequent submittal, specific item, or class of material or equipment for which a submittal is required. However, transmittal of a submittal of various items using a single transmittal form will be allowed when the items taken together constitute a "package" or are so functionally related that expediency dictates review of the package as a whole. A multiple-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the Engineer.

f. Each transmittal shall identify the specification section that relates to item being submitted.

g. After checking and verifying all field measurements, the Contractor shall thoroughly review each shop drawing for compliance and compatibility and stamp "APPROVED" and sign each shop drawing to indicate that a thorough review was made by the Contractor and that the Contractor has approved the shop drawing for the project prior to submission for the Engineer's review.

(1) Submittals shall bear a stamp or specific written indication that Contractor has satisfied its responsibilities under the Contract Documents with respect to the review of the submittal and have a signature by the Contractor.

(2) Data shown shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to enable Engineer to review the information.

(3) Submittals shall specify by checking a box "Yes" or "No" as to whether the submittal meets the Buy American requirements. All submittals shall be accompanied with Buy American certifications or Buy American waivers. Only Third-Party certified manufacturers, listed in AC 150/5345-53, Appendix 3 Addendum (as required) and meeting the BUY AMERICAN preference requirements can provide equipment and materials specified in the Contract Documents. Documentation certifying compliance with the BUY AMERICAN preference rules for Airport Improvement Program (AIP) cited in 49 USC §50101) shall be included with each equipment and material submittal.

h. Check the samples and accompany with specific written indication that Contractor has satisfied requirements under the Contact Documents with respect to review of submittals, and identify clearly as to material, supplier, pertinent data such as catalog numbers and the intended use.

i. Before submission of each submittal, determine and verify quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto; review and coordinate each submittal with other submittals, requirements of work, and the Contract Documents.

j. Submittals shall specify by checking a box "Yes" or "No" as to whether the submittal contains variations to the Contract. At the time of each submission, give Engineer specific written notice of each variation that the submittal may have from the requirements of the Contract Documents; in addition, make specific notation on each shop drawing submitted to Engineer for review and approval of each such variation.

k. The Engineer will review up to two (2) submittals for each item. It is considered reasonable that the Contractor shall make a complete and acceptable submittal to the Engineer by the second submission of a submittal item. All costs to review shop drawings submitted more than twice to receive a "Re-submittal Not Required" or other approval designation, shall be borne by the Contractor. The County reserves the right to withhold moneys due the Contractor to cover additional cost of the Engineer's review beyond the second submittal.

l. The Engineer's review is for general conformance to the Contract Documents and no check will be made to confirm dimensions, compatibility with other elements of the Work, or deviations from the Contract Documents which have not been specifically identified by the Contractor. Contractor is responsible for the installation of complete, functional improvements in accordance with the Contract Documents.

m. Engineer's review will be only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents, not extending to means, methods, techniques, sequences, or procedures of construction (except where a specific means, method, technique, sequence, or procedure of construction is indicated in or required by the Contract Documents) nor to safety precautions or programs incident thereto. The review of a separate item as such will not indicate the review of the assembly in which the item functions.

n. Where a shop drawing or sample is required by the Specifications, related work performed prior to Engineer's review and approval of the pertinent submission shall be the sole expense and responsibility of Contractor.

o. Review, acceptance, or approval of substitutions, schedules, shop drawings, list of materials, and procedures submitted or requested by Contractor shall not add to the Contract amount, and additional costs which may result therefrom shall be solely the obligation of Contractor.

p. The County is not responsible to provide engineering or other services to protect Contractor from additional costs accruing from submittals.

q. Submittals processed by Engineer do not become Contract Documents and are not Change Orders. The purpose of submittal review is to establish a reporting procedure and is intended to allow the Engineer to monitor Contractor's progress and understanding of the design.

r. Delays caused by the need for re-submittal shall not constitute a basis for claim.

s. The County reserves the right to modify the procedures and requirements for submittals, as necessary to accomplish the specific purpose of each submittal. Direct inquiries regarding the procedure, purpose, or extent of any submittal shall be submitted to the Engineer.

SP-100-1.13 Adjust Survey Monument to Finished Grade. Not included in this Project.

SP-100-1.14 Time Limitations. The current expected Contract date is June 20, 2026. This is contingent on receiving FAA Grant funding. The overall time of completion for this Project is One Hundred and Eighty (180) calendar days The Project will be divided into two (2) construction phases Should this time schedule not be met, liquidated damages will be assessed. Refer to the Liquidated Damages for detailed time limitations for the specific work areas. A summary of contract time is divided as follows:

A. Mobilization Element. Notice to Proceed with Mobilization shall be given within five (5) working days after award of Contract. All work included in Mobilization shall be completed within Forty-

five (45) calendar days. No work shall be performed that restricts Airport operations until a construction schedule has been submitted by the Contractor and approved by the County. A minimum of 48-hours' notice shall be given prior to the closure of any Airport facility.

B. Construction Element. - See CSPP

SP-100-1.15 Liquidated Damages. Time is of the essence for all Work to be performed. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that County will sustain in the event of and by reason of Contractor's delay; therefore, pursuant to Government Code section 53069.85 and Public Contract Code section 7203, Contractor shall forfeit and pay to County the following sum(s) as liquidated damages ("Liquidated Damages") for failing to achieve the following milestones:

A. Milestone 1 – Mobilization. Completion of the Mobilization and Pre-Construction Phase within its specified time.

B. Milestone 2 – Construction Phase. Completion of the Construction Phase(s) within the specified time.

C. Milestone 3 – Equipment Phase. Completion of the Equipment Phase(s) within the specified time.

D. Milestone 4 – Post Construction. Completion of the Post Construction Phase with its specified time.

Table 1. Time Limitations and Liquidated Damages

Milestone	Start	Completion	Liquidated Damages (LDs)
Mobilization	Within 5 working days of NTP	Up to 45 calendar days	N/A
Construction Phases	The Construction Phase will begin on that date agreed upon by the Contractor, Engineer, and Airport once the Mobilization Milestone is complete.	Start + 180 calendar days	$5,000 per day as Liquidated Damages for each and every day's delay beyond the time herein prescribed in finishing the Work of Milestone No. 2.
Equipment Phases	At the conclusion of Phase 1 when the temporary baggage system is in use and Phase 2 when the new baggage system is in use.	Beginning of Phase 2 and End of Phase 2.	$5,000 per day as Liquidated Damages for each and every day's delay beyond the time herein prescribed in finishing the Work of Milestone No. 3.
Punch list and Record Drawings		**Project completion** January 12, 2027	N/A

A. Each portion of the Liquidated Damages shall be calculated cumulatively. For example, if Contractor is late in completing three milestones, Contractor will forfeit and pay three separate Liquidated Damages amounts. It is hereby understood and agreed that neither the total cumulative Liquidate Damages amount nor any portion of the Liquidated Damage amount are penalties.

B. County may deduct Liquidated Damages from money due or that may become due Contractor under this Agreement. Contractor's forfeiture of Liquidated Damages to County, and County right to retain Liquidated Damages, are as indicated in Government Code section 53069.85 and as indicated herein and in the General Conditions. Liquidated Damages are automatically and without notice of any kind forfeited and payable by Contractor upon the accrual of each day of delay. Neither County's failure or delay in deducting Liquidated Damages from payments otherwise due the Contractor, nor County's failure or delay in notifying Contractor of the forfeiture and payment of Liquidated Damages, shall be deemed a waiver of County's right to Liquidated Damages and/or the County's right to withhold Liquidated Damages from any amounts that would otherwise be payable to the Contractor.

C. Contractor and Surety shall be liable for and pay to County the entire amount of Liquidated Damages including any portion that exceeds the amount of the contract then held, retained or controlled by County.

D. Liquidated Damages shall be in addition, and not in lieu of, County's right to charge Contractor for the County's cost of completing or correcting items of the Work.

SP-100-1.16 Barricades and Delineators The Contractor shall provide 8-foot long, low profile, as manufactured by Multi-Barrier (Model AR-10 x 96), Sherwin Industries, Inc., or approved equal. They shall be equipped with reflective striping on each side and with two (2) flashing, solar-powered lights. The Contractor shall place, fill with water, and maintain the low-profile barricades and solar flashing lights during construction at the locations indicated on the Plans and in the CSPP.

Additionally, the Contractor shall provide plastic delineators as required to barricade hazardous areas. Unless otherwise approved by the Engineer, delineators shall be 42-inch-high molded plastic. Delineators shall be four inches in diameter, florescent orange, supplied with a weighted base and reflective stripes. Lighting for barricades will be provided at night as approved by the RPR. All costs associated with this item shall be included in Airfield Safety and Traffic Control.

SP-100-1.17 Runway Closure Markers (Crosses). Not Required.

SP-100-1.18 Radio Communication with Air Traffic Control Tower (ATCT). All traffic within the movement areas of the Airport, including aircraft and motor vehicles, are controlled by the ATCT between the hours of 6:00 A.M. and 8:00 P.M. No portion of work is anticipated adjacent to movement area(s) under the control of ATCT; but aircraft will be present due to the location of work adjacent to the terminal apron. The Contractor shall have on-site at all times an aviation radio, which receives and transmits on a frequency of 121.600 and 124.000. The limits of the Movement Area will be communicated with the Contractor during the required training meeting(s).

Two-way radio communication capabilities with the ATCT shall be maintained at all times when working or traveling at or near a controlled area. The Contractor shall supply radios and personnel capable of communication with the ATCT during the hours of tower operation. The Contractor will also be required to monitor communications during non-towered hours. When a runway or taxiway is open to air traffic, Contractor must provide a radio-equipped escort before any of his personnel or equipment proceeds onto or across the taxiways or runways or within the safety areas of respective pavements. If the Contractor is working in more than one location, each work area shall have a radio as directed by the RPR. A radio-equipped flagman shall be used to control vehicular traffic crossing active areas during hauling operations. The Contractor's radio operations personnel shall be trained by Airport personnel prior to using radios.

The Contractor shall provide at least two (2) fully functional hand-held aviation radios with battery chargers for use during construction. Radios shall be ICOM-IC-A6 transceivers, each supplied with battery pack, spare battery pack, whip antenna, desktop charger, and a 12V adaptor/charger. If more than two (2) radios are required, the Contractor shall supply them at his own expense.

SP-100-1.19 Access and Security.

A. Contractor Access. Contractor access to the various work areas shall be via the closest access routes indicated on the Project Layout Plan. Additional haul routes on Airport property shall be approved by the Airport. All access routes and haul routes shall be kept clean and free of debris. Dust control shall be maintained. Where haul routes cross active runways, taxiways, or aprons, radio-equipped flaggers shall be provided by the Contractor as required.

B. Access Security Control.

The Contractor shall be responsible for maintaining Airport security at all gates designated for their use. Gates must be locked or manned by the Contractor's personnel to ensure no unauthorized access to the air operations area. All access gates shall be kept clear of equipment and material.

SP-100-1.20 Work Hour Limitations. Work hour limitations imposed on this project are per the CSPP.

SP-100-1.21 Winter Shutdown. A winter shutdown is not anticipated for this project

SP-100-1.22 Guarantee of Workmanship and Materials and Date of Acceptance. Besides guarantees required elsewhere, Contractor shall and does hereby guarantee all workmanship and materials for a period of one year, except as otherwise required in the Contract for a longer period, from and after the date of acceptance of the Work and recordation of Notice of Completion by County and shall repair or replace any or all workmanship and materials, together with any other work which may be displaced in so doing, that, in the opinion of the Owner, is or becomes defective during the period of said guarantee without expense whatsoever to Owner.

SP-100-1.23 Temporary Haul Route. Not Required.

SP-100-1.24 Airport Access and Haul Route Repair. Airfield pavements will be used extensively for access to the Airport during construction. Prior to construction, the Contractor will document and videotape the existing pavement condition for access and haul routes to be used for the project. Travel on these pavements and routes will be controlled by the Airport, and the Contractor shall remain within specified access routes. After construction is complete, all Airport pavements used during the project shall be evaluated for damage and repaired as directed by the Airport or RPR. This work may include pavement removal, unclassified excavation, new aggregate base, and new hot mix asphalt pavement; or other methods as determined acceptable by the Airport or RPR. Payment for this work will be based on actual time and expenses (also defined as force account) incurred for repairs and approved by the Airport. An allowance has been included in the Proposal Form/Bid Schedule for this work. The actual amount paid may vary as required and approved by the Airport.

SP-100-1.25 Hazardous Waste Abatement. The Contractor is advised that hazardous waste in the subsurface soils, though not expected, may be encountered during construction. Any suspect material uncovered shall be immediately brought to the County's attention. All costs associated with removing the hazardous material to meet local, state, and federal regulations will be performed under a Contract Change Order.

SP-100-1.26 Permits, Certificates, Licenses, Fees, Approval. The Contractor shall be required to obtain all Permits. The Contractor shall ensure sufficient time in its Construction Schedule to secure and obtain all permits and shall not be permitted to claim a delay in the Project due to a delay in obtaining a Permit.

SP-100-1.27 Construction Delay due to Unfavorable Weather. Due to potential timing of grant and contract award, as well as material procurement, the anticipated timeframe when Construction will be ready to commence is late-summer or early-fall after the preconstruction meeting is held. Once the Mobilization Element is complete and materials have been procured or a firm schedule for procurement is established, the Contractor shall evaluate the upcoming weather forecast and determine if winter weather and/or lack of an adequate labor force, materials and/or supplies may have an impact on commencing and completing Construction in a timely manner. The Contractor, County, and Engineer will arrive at a mutual determination as to whether the Construction Element should be delayed as a result of the weather. Due to the nature and geometry of the Project, suspending work once it has started will result in an incomplete product and will be detrimental to Airport operations.

A Notice to Proceed with the Construction Element will be issued once the conditions described herein are met; and the Contractor, County, and Engineer determine the Project can be satisfactorily completed

without an anticipated suspension due to weather and/or COVID-19 factors. Additional payment will not be made in the event a delay of the Construction Element is necessary. The Contractor shall honor all bid prices when Construction commences.

SP-100-1.28 Construction Water Meter Requirements. The source of construction water for the Project shall be coordinated by the Contractor. The Contractor shall pay water and meter fees; and make all necessary arrangements with appropriate local utility to secure construction water for the duration of the Contract. No direct payment will be made for this work. The Contractor shall include all costs associated with construction water in the price of the work.

SP-100-1.29 Hearing Protection. Due to the nearby aircraft operations, the Contractor shall provide all necessary hearing protection for workers.

SP-100-1.30 Cultural Resources Assessment. In the event that archaeological materials are encountered during construction, all construction work shall be halted, and a certified archaeologist shall be consulted to determine the appropriate treatment of the discovery.

In the event human remains are encountered, State Health and Safety Code – Section 7050.5 states that, no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code – Section 5097.98. The County Coroner must be notified of the find immediately.

If the remains are determined to be Native American, the County Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD will have the opportunity to offer recommendations for the disposition of the remains.

SP-100-1.31 Environmental Requirements. The Contractor shall comply with NEPA and CEQA environmental requirements. Specific requirements that pertain to the Contractor are shown within the Project Plans. The complete requirements are included in the Mitigated Negative Declaration and Initial Study, which is attached to the Special Provisions as *Appendix 5*. All costs relating to complying with the environmental documents shall be included in other items of work.

SP-100-1.32 Application for Payment and Required Items. Applications for payment shall follow the standard County format based on the schedule of items included in the proposal forms. The Contractor shall also supplement the pay application with amounts being paid to subcontractors and the amounts being paid to DBE firms. Subcontractor and DBE amounts shall be delineated by bid items in the proposal forms.

SP-100-1.33 Temporary Chain Link Fence. The Contractor shall provide and install temporary chain-link fence in accordance to the Plans as required for entrance into the construction site. This item includes the procurement, installation, securing, and maintenance during construction and removal of the temporary chain-link fence.

SP-100-1.34 Guard Posts. The Contractor shall provide and install Guard Posts in accordance with the Plans. This item includes furnishing all the material for and installation of the Guard Posts.

SP-100-1.35 Asphalt Surface Course. The Contractor shall provide and place hot mix asphalt that meets or exceeds the County of San Luis Obispo Public Improvement Standards. The Contractor shall submit the mix design to the Engineer a minimum of 10 working days prior to placement. No asphalt shall

be placed until written approval is received from the Engineer. After asphalt has been placed and compacted, the Contractor shall test the site to ensure no ponding occurs and all water drains to nearby catch basins. The Contractor shall rework all areas where drainage does not occur.

SP-100-1.36 Crushed Aggregate Base Course. The Contractor shall provide and place crushed aggregate base that meets the County of San Luis Obispo Public Improvement Standards. The Contractor shall submit the aggregate base to the Engineer a minimum of 10 working days prior to placement for approval. No aggregate base shall be placed until written approval is received from the Engineer. The Contractor shall, in the presence of the RPR, confirm grades have been achieved and are within +0 feet and -.03 feet of the specified grade.

SP-100-1.37 Concrete Landings. The Contractor shall provide and place portland concrete cement that meets the County of San Luis Obispo Public Improvement Standards. The Contractor shall submit concrete mix design to the Engineer a minimum of 10 working days prior to concrete placement for approval. No concrete shall be placed until written approval is received from the Engineer. The Contractor shall also provide concrete reinforcement as shown on the Plans.

SP-100-1.38 6" Fire Main Lateral. The Contractor shall provide and install the fire main lateral shown on the Plans in accordance to the County of San Luis Obispo Public Improvement Standards.

SP-100-1.39 Thrust Blocks. The Contractor shall provide and install thrust blocks shown on the Plans in accordance to the County of San Luis Obispo Public Improvement Standards.

SP-100-1.40 6"x6" Tapping Tee and Connection. The Contractor shall provide and install the 6"x6" Tapping Tee shown on the Plans in accordance to the County of San Luis Obispo Public Improvement Standards.

SP-100-1.41 6" Gate Valve. The Contractor shall provide and install the 6" Gate Valve shown on the Plans in accordance to the County of San Luis Obispo Public Improvement Standards.

SP-100-1.42 Valve Can and Appurtenances. The Contractor shall provide and install the Valve Can and Appurtenances shown on the Plans in accordance to the County of San Luis Obispo Public Improvement Standards.

SP-100-1.43 Salvaged Fire Hydrant. The Contractor shall provide and install the salvaged fire hydrant and bury shown on the Plans in accordance to the County of San Luis Obispo Public Improvement Standards.

METHOD OF MEASUREMENT

SP-100-2.1 Airfield Safety and Traffic Control will be measured as a lump sum item.

SP-100-2.2 Construction Staking and Survey Layout will be measured as a lump sum item.

SP-100-2.3 Access Route Improvements/Repair, as directed by the Agency, will be measured as a time-and-expense item, based upon the actual work performed.

SP-100-2.4 Temporary chain link fence will be measured as a lump sum item.

SP-100-2.5 Guard Post will be measured per each. No separate measurements shall be made for excavation and materials requires to install guard post.

SP-100-2.6 Asphalt Surface Course will be measured per ton of asphalt in the accepted work. Batch weights or truck scale weights will be used to determine the basis for tonnage. No extra measurement shall be made for asphalt that is reworked and not accepted.

SP-100-2.7 Crushed Aggregate Base Course will be measured per cubic yard of in-place crushed aggregate base.

SP-100-2.8 Concrete Landing, 4" Depth will be measured per square yard.

SP-100-2.9 Concrete Landing, 6" Depth will be measured per square yard.

SP-100-2.10 Concrete Landing with Step will be measured per square yard.

SP-100-2.11 6" Fire Main Lateral will be measured per lump sum.

SP-100-2.12 Thrust Blocks will be measured per each.

SP-100-2.13 6"x6" Tapping Tee and Connection will be measured per each.

SP-100-2.14 6" Gate Valve will be measured per each.

SP-100-2.15 New Valve Can and Appurtenances on Existing Valve will be measured per each.

SP-100-2.16 Remove Cap and Install Salvaged Fire Hydrant and Bury will be measured per each.

BASIS OF PAYMENT

SP-100-3.1 Airfield Safety and Traffic Control will be paid for at the Contract lump sum price. This price shall include full compensation for all labor, materials, tools, equipment, CSPP compliance, SPCD preparation and compliance, and incidentals necessary to complete the work as specified in this Specification and requirements shown on the Plans.

SP-100-3.2 Construction Staking and Survey Layout will be paid for at the Contract lump sum price and shall include all staking and survey required to construct the Project to the lines and grades as indicated on the Plans to meet the specified tolerances.

SP-100-3.3 Access Route Improvements/Repair allowance will be paid for on a lump sum basis. An allowance for this work is included on the Proposal Form/Bid Schedule. The Agency reserves the right to vary this quantity as required from zero to the full amount, to cover applicable work.

SP-100-3.4 Payment for Temporary Chain Link Fence to secure construction shall be paid at the Contract lump sum price. Payment shall include materials, securing temporary fence, and relocation as needed to facilitate construction operations as needed throughout construction. Temporary addition of gate(s) shall be included in this lump sum payment.

SP-100-3.5 Guard Post payment shall be paid at the Contract unit price per each. The price shall include full compensation for all labor, materials, tools, equipment, and incidentals to complete the work as detailed in this Specification and shown on the Plans.

SP-100-3.6 Payment for Asphalt Surface Course meeting all acceptance criteria as specified per the County of San Luis Obispo Public Improvement Standards shall be made at the contract unit price per ton. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.7 Payment for Crushed Aggregate Base Course meeting all acceptance criteria for the County of San Luis Obispo Public Improvement Standards shall paid at the contract unit price per cubic yard. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.8 Payment for Concrete Landing, 4" Depth meeting all acceptance criteria for the County of San Luis Obispo Public Improvement Standards shall paid at the contract unit price per square yard. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.9 Payment for Concrete Landing, 6" Depth meeting all acceptance criteria for the County of San Luis Obispo Public Improvement Standards shall paid at the contract unit price per square yard. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.10 Payment for Concrete Landing with Step meeting all acceptance criteria for the County of San Luis Obispo Public Improvement Standards shall paid at the contract unit price per square yard. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.11 Payment for 6" Fire Main Lateral meeting acceptance criteria for the County of San Luis Obispo Public Improvement Standards and shown on the Plans shall be paid for at the contract unit price per lump sum. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item. Price shall also include excavation, compaction, and all effort required for the in-place acceptance.

SP-100-3.12 Payment for Thrust Block meeting acceptance criteria for the County of San Luis Obispo Public Improvement Standards and shown on the Plans shall be paid for at the contract unit price per each. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.13 Payment for 6"x6" Tapping Tee and Connection meeting acceptance criteria for the County of San Luis Obispo Public Improvement Standards and shown on the Plans shall be paid for at the contract unit price per each. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.14 Payment for 6" Gate Valve meeting acceptance criteria for the County of San Luis Obispo Public Improvement Standards and shown on the Plans shall be paid for at the contract unit price per each. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.15 Payment for New Valve Can and Appurtenances on Existing Valve meeting acceptance criteria for the County of San Luis Obispo Public Improvement Standards and shown on the Plans shall be paid for at the contract unit price per each. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

SP-100-3.16 Payment for Remove Cap and Install Salvaged Hydrant and Bury meeting acceptance criteria for the County of San Luis Obispo Public Improvement Standards and shown on the Plans shall be paid for at the contract unit price per each. The price shall be compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item SP-100-3.1	Airfield Safety and Traffic Control – per lump sum
Item SP-100-3.2	Construction Staking and Survey Layout – per lump sum
Item SP-100-3.3	Airport Access and Haul Route Repair – per lump sum
Item SP-100-3.4	Chain Link Fence, Temporary – per lump sum
Item SP-100-3.5	Guard Post – per each
Item SP-100-3.6	Asphalt Surface Course – per ton
Item SP-100-3.7	Crushed Aggregate Base Course – per cubic yard
Item SP-100-3.8	Concrete Landing, 4” Depth – per square yard
Item SP-100-3.9	Concrete Landing, 6” Depth – per square yard
Item SP-100-3.10	Concrete Landing with Step – per square yard
Item SP-100-3.11	6” Fire Main Lateral – per lump sum
Item SP-100-3.12	Thrust Block – per each
Item SP-100-3.13	6”x6” Tapping Tee and Connection – per each
Item SP-100-3.14	6” Gate Valve – per each
Item SP-100-3.15	New Valve Can and Appurtenances on Existing Valve – per each
Item SP-100-3.16	Remove Cap and Install Salvaged Fire Hydrant and Bury – per each

EXHIBIT C
How to Apply for an AOA Badge
AOA Badge Application Information and Requirements

An AOA badge is the most common type of badge. The AOA is defined as all areas within the fenced portion of the airport excluding the SIDA. This badge will allow access to general aviation areas of the airport. It **does not** allow access to the SIDA/Secure area at the terminal building.

AOA Badging Process:

1. **Application:** Your affiliation's signatory authority (employer, lease site organization or other approved entity known to Airport Management) will decide the level of access you will be granted. You will be required to complete and sign a badge application form. The form may be completed online but must be signed by hand. The authorized signatory must also complete and sign their parts of the form.
2. **Identity Verification:** During badging hours, you will be required to bring your completed and signed application to the badging office, along with two forms of matching identification, one of which must be a primary form.

Primary forms of identification are government-issued cards or documents exhibiting both the bearer's photograph and signature. They must be written in the English language and valid, not expired or suspended. Primary forms may include:

- State-issued driver's license
- Government-issued identification card
- Passport
- Military ID card

Secondary forms of identification may be used to support primary documents. They must not be expired, if an expiration date is applicable. Secondary forms may include:

- Original or certified copy of birth certificate
- Social Security card
- Certificate of birth abroad issued by Department of State
- US Citizen ID Card
- Employment authorization issued by Department of Homeland Security

For non U.S. Citizens: In addition to the required documents above bring one of the following: Permanent Resident Card or Alien Registration Receipt Card. If you do not have Alien registration card, provide I-94 Form and Non-Immigration Visa.

1. **Training:** While you are being validated through the clearing house, you need to register for an online training course. Once you have been cleared by the TSA, you will be emailed a voucher code to log in and complete your training course.
2. **Payment and Badge Pick-up:** Once you have successfully completed the online training course, we will call you within a week to let you know that your badge has been created and is ready for pick-up. At the time of pick-up, you will pay the new AOA badge fee of $56. Badges can be picked up in the badging office during badging hours.

END OF SECTION SP-100

DIVISION III - PART 2

Construction Safety and Phasing Plan

SLO COUNTY AIRPORT

CONSTRUCTION SAFETY AND PHASING PLAN

BAGGAGE SCREENING SYSTEM

AIP No. 3-06-0228-066-2026

Prepared by

June 19, 2026

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CONSTRUCTION SAFETY AND PHASING PLAN

1. OVERVIEW

The County of San Luis Obispo (County) is required to adhere to the standards contained in the various Federal Aviation Administration (FAA) Advisory Circular (AC) 150 series as part of the Airport's grant assurance obligations in return for accepting federal funds under the Airport Improvement Program (AIP) and Passenger Facility Charge (PFC) for the design and construction of airport projects. The goal of this Construction Safety and Phasing Plan (CSPP) is to achieve and maintain a desirable level of operational safety during construction. This plan provides information, responsibilities, and procedures to implement the requirements of the contract safety provisions and FAA AC 150/5370-2G, *Operational Safety on Airports During Construction*.

Hazardous practices and marginal conditions created by construction activities can decrease or jeopardize operational safety on the San Luis Obispo County Airport (Airport). To minimize disruption of normal aircraft operations and avoid situations that compromise the Airport's operational safety, *ALL* construction activity that occurs within the boundaries of the Airport must be carefully planned, scheduled, and coordinated with the County and the FAA.

This CSPP is intended to provide general information to all Contractors, subcontractors, or suppliers (Contractor) on the requirements and procedures for accident prevention, safety, and security at the Airport during the Outbound Baggage Improvements Project (Project). Contractors shall conduct their operations in a manner that will provide safe working conditions for all personnel, in addition to protection of the Airport tenants and users who may be affected by the Project's construction activities.

Nothing contained in this CSPP is intended to relieve the Contractor of the obligations assumed by the Contractor under contract with the County, or as required by law. Safety must be an integral part of each job. Full participation, cooperation, and support are necessary to ensure the safety and health of all persons and property involved in the Project.

The purpose of marking, barricading, and lighting airside construction areas is to delineate potentially hazardous areas and prevent unauthorized incursions into the area by personnel, vehicles, and equipment during construction. Visible barricade lines will be established prior to construction activity within the Air Operations Area (AOA) if portions of the AOA remain operational during construction. All vehicles will be marked in accordance with FAA AC 150/5210-5D, *Painting, Marking, and Lighting of Vehicles Used on an Airport.*

Requirements and procedures in this CSPP may be altered on a case-by-case basis if determined by the County that safety is not compromised and the proposed alternative better meets operational or Project needs. Any such alterations or deviations shall be at the sole discretion of the County.

The critical operational areas at the Airport are defined as follows:

1.1 The AOA, for the purpose of this document, is defined as any part of the Airport utilized for aircraft operations and includes any area inside the perimeter fence. (See *Attachment 1.*)

1.2 Runway Safety Area (RSA) and Taxiway Object Free Area (TOFA) / Taxilane Object Free Area (TLOFA), as described in FAA AC 150/5370-2G, are restricted areas. The dimensions are described in FAA AC 150/5300-13B, *Airport Design*.

2. AIRPORT CONTACT NUMBERS

The following are the contact persons and numbers for this Project.

TITLE	NAME	PHONE
Airport Deputy Director	Tim O'Keeffe	(805) 788-2319 – Office (805) 748-4181 – Cell
Airport Operations	On-Duty Personnel	(805) 788-2000
Civil Engineer of Record	Rafael Gonzalez	(909) 219-8213
Architect of Record	Tim Dacey	(971) 717-6502
Mechanical Engineer of Record	Aaron Koch	(303) 481-7008
Electrical Engineer of Record	John Hudock	(414) 935-4249
Architect of Record	Tim Dacey	(971) 717-6502
Fire Protection of Record	Dakota Roth	(608) 443-0422
Construction Manager	Greg Mead	(602) 432-4621
Resident Project Representative (RPR)	TBD	TBD

Injuries are to be reported to the County and Airport Operations personnel immediately. Medical and police assistance may be reached by calling 911. All phone numbers should be placed on the Project phone list that shall be kept in all Contractor supervisor vehicles.

3. PROJECT SCOPE OF WORK

The Project will primarily consist of a new outbound baggage system located at the existing outbound baggage area on the southwest side of the Terminal Building. This Project includes the construction of a new tensile structure, canopy, and new outbound baggage system. The site improvements will consits of foundation excavation, pavement removal, water line installation, communication line installation, storm drain adjustments and improvements, foundation construction, site grading, and pavement construction.

Commercial and private-based aircraft currently utilize the Airport. The Project phasing has been staged to accommodate minimal disruption to the Airport and optimize construction sequencing. The location of these improvements is depicted on the plan sheets (See *Attachment 1*).

4. CONSTRUCTION SAFETY AND PHASING PLAN REQUIREMENTS

The requirements outlined below correspond with the subjects contained in FAA AC 150/5370-2G, Chapter 2, Section 2.4. The FAA's Construction Safety and Phasing Plan Checklist was utilized in the preparation of this CSPP, and all items required on the checklist have been addressed.

4.1 Coordination

Airport staff will coordinate with the tenants and operators affected by this Project in advance of the start of construction. The Air Traffic Control Tower (ATCT) will be included in the coordination of airfield facility temporary closures. Additional information regarding notification of construction activities is contained in Section 12 of this CSPP. The locations of these facilities are depicted in *Attachment 1*.

Prior to the start of construction, the Airport will host a mandatory preconstruction meeting with the Contractor and at least one representative from each of its subcontracting companies. The meeting will discuss all items listed on the Construction Safety and Phasing Plan Checklist and items in this CSPP, to include:

4.1.1 Submission of Contractor's preliminary construction schedule, barricade plan, list of equipment, list of subcontractors, Contractor's emergency phone number list, and items required by the Project Safety Plan Compliance Document (SPCD).

4.1.2 Identification of the Contractor's superintendent, and a discussion of his authority and responsibilities.

4.1.3 Designation of the County representative responsible for notifying the Flight Service Station serving the Airport of the proposed start and completion dates of construction, or any circumstances requiring a Notice to Airmen (NOTAM).

4.1.4 Scheduling of work and the need to perform certain items at various stages of the Project, including operational safety issues which might arise because of the proposed work.

4.1.5 Establishment of a desired date for issuance of a Notice to Proceed (NTP).

4.2 Contractor Progress Meetings

Progress meetings to discuss construction scheduling and safety issues will be held on a regular basis at the Airport for the duration of the Project. The agenda will include a standing agenda item to discuss safety issues at these meetings.

4.3 Scope or Schedule Changes

After the initial approval of the Contractor's schedule, the construction schedule will be a standing agenda item for discussion at the construction progress meetings. Any changes to the Project scope of work or change of schedule will require approval by the County.

4.4 FAA Air Traffic Organization (ATO) Coordination

Airport staff will coordinate with San Luis Obispo ATCT before and during construction of this Project to verify construction activities are on schedule and progressing according to plan. Submittal of the Project CSPP will be in accordance with FAA requirements.

5. PHASING

This Project has been phased to minimize operational impact to the Airport users. The scope of work for this Project is described in Section 3 of this CSPP. The construction limits for each phase of work are shown on Plan Sheets G-081 to G-083 (See *Attachment 1*). A general description of the construction work and special phasing requirements follows.

5.1 Phase 1

Location	Existing Outbound Baggage – Area between existing outbound baggage area and the Terminal Building.
Closures	Area between existing outbound baggage area and the Terminal Building.
Operational Impact	Area between existing outbound baggage and Terminal Building to be closed for the duration of Phase 1. All Contractors shall stop and be

inspected by Airport Operations before entering Security Identification Display Area (SIDA). Contractor vehicles or personnel shall not cross into SIDA without proper Airport approval. Apron access shall be coordinated with Airport. Contractor to always maintain access to existing outbound baggage. The Contractor shall remain clear a minimum of 25 feet of all parked aircraft. The Contractor shall remain clear of all aircraft envelopes.

Work Elements — Description:

- Install temporary baggage belt and cover foundation.

5.2 Phase 2

Location — Existing Outbound Baggage / Terminal Apron – Northwest apron area between Terminal Apron and Airport Operations Building.

Closures — Northwest apron area between Terminal Apron and Airport Operations Building.

Operational Impact — Northwest apron area between Terminal Apron and Airport Operations Building to be closed for the duration of Phase 2. All Contractors shall stop and be inspected by Airport Operations before entering Security Identification Display Area (SIDA). Contractor vehicles or personnel shall not cross into SIDA without proper Airport approval. Apron access shall be coordinated with Airport. Contractor to always maintain access to existing outbound baggage. The Contractor shall remain clear a minimum of 25 feet of all parked aircraft. The Contractor shall remain clear of all aircraft envelopes.

Work Elements — Description:

- Removal of existing outbound baggage.
- Pavement removal.
- Site grading.
- Storm drain improvements.
- Utility improvements.
- Foundation construction.
- Pavement construction.
- Installation of new outbound baggage system, canopy, and tensile structure.

Total contract time allowed for construction work shall be 180 calendar days.

6. AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION

This CSPP presents possible safety problems that could occur during a typical airport construction project. Any of these safety problems could occur if this plan is not followed in any part of the Project areas. The Project will impact operations and facilities as described above. The work is not expected to impede firefighting access. Details depicting phasing limits, general barricade placement, access routes, and other information are contained in *Attachment 1*.

7. PROTECTION OF NAVIGATIONAL AIDS (NAVAIDs)

The Airport's NAVAIDs are located outside the Project areas and will not be affected by this Project.

8. CONTRACTOR ACCESS

Maintaining control of construction personnel within the AOA is crucial for the safety of workers and aircraft. The Contractor's personnel will only be permitted access to the Airport at designated locations and will be restricted from entering all active Runway Object Free Areas (ROFA), Runway Object Free Zones (ROFZ), Runway Safety Areas (RSA), Taxiway Object Free Areas (TOFA), and Taxilane Object Free Areas (TLOFA). Contractor access and haul routes are depicted on the Project plan and contained in *Attachment 1*. The Contractor's personnel will not be allowed to leave the Project area unless escorted by Airport Operations personnel or Authorized Personnel. Cones and barricades shall be used to keep the Contractor's personnel from inadvertently entering active aircraft areas. The Contractor will acknowledge and comply with the following requirements.

8.1 Location of Stockpiled Construction Materials

Stockpiled material must be stored in the staging yard until needed for placement. Stockpiled soils and aggregate materials shall be watered and consolidated as necessary to prevent airborne particulates. Material stockpile heights in excess of 15 feet will not be allowed.

8.2 Vehicle and Pedestrian Operations

No unauthorized entry to the SIDA and AOA will be permitted. Workers and equipment will be restricted to the approved entry points and access routes to work areas. The Contractor shall provide a trained gate guard at all times when the access gate is not secured. The gate guard shall prevent any unauthorized vehicles and pedestrians from entering the AOA. The gate guard shall also ensure that authorized construction and delivery vehicles are properly marked and lit prior to allowing them to enter the AOA.

8.2.1 Construction Equipment / Personnel Parking

Contractor employee parking shall be coordinated with the Airport. No personal vehicles will be allowed in the AOA. Construction equipment will be parked at the Staging Area designated by the Airport and Project area shown in *Attachment 1* when not in use.

8.2.2 Access and Haul Roads

The locations of construction traffic routing are depicted in the plan sheet, included as *Attachment 1*, and the Project plan set. Access to the work areas will be delineated with traffic cones or other approved traffic control devices.

8.2.3 Marking and Lighting of Vehicles

All Contractor and Airport Operations vehicles involved with this Project will comply with FAA AC 150/5210-5D. All construction vehicles and equipment operating in the AOA during daylight hours must be provided with a flag and/or 360° rotating/flashing amber beacon attached to the vehicle so that the flag and/or beacon will be readily visible. The flag shall be three feet square consisting of aviation orange and white squares on each side. All construction vehicles and equipment operating on Airport property at night must be provided with a 360° rotating/flashing amber beacon attached to the vehicle so that the lights will be readily visible. All construction vehicles and equipment parked within the AOA after a shift is completed are required to be equipped with a flag. Noncompliant vehicles will not be allowed within the AOA.

8.2.4 Description of Proper Vehicle Operations

In the event that the Contractor leaves the closed Project area and gets disoriented, he/she shall remain in place and call Airport Operations.

8.2.5 Required Escorts

All vehicles operating within the AOA or SIDA that are being driven by individuals without the appropriate Airport Security Badge and driver training, as described herein, shall be escorted. If any delivery vehicles need to get from the access gate to the work area, the Contractor shall provide an escort as required by the Airport.

8.2.6 Requirement for Vehicle Drivers

All personnel operating a motor vehicle unescorted within the AOA of the Airport shall have a valid state-issued driver's license and be required to obtain training in ground vehicle operations provided by the Airport. To qualify to drive on the AOA, individuals must possess two forms of identification, be fingerprinted, pass a criminal background check, and clear a security threat assessment. Individuals must complete an application, attend an online training seminar, and successfully pass an online exam.

All vehicle drivers must be aware of their environment at the Airport and confirm by personal observation that no aircraft are approaching their position (either in the air or on the ground) when crossing any area of the Airport open to aircraft operations.

8.2.7 Situational Awareness

The Contractor's forces will be restricted to the closed areas in which work is to be performed. The Contractor shall train their personnel to recognize and avoid the hazards of jet blast when in proximity to active areas. The Contractor shall train its personnel to be aware of all aircraft that are operating in the area.

8.2.8 Two-Way Communication Procedure

All communication with the ATCT shall be through the RPR and/or Airport Operations. Airport Operations personnel or the RPR will monitor air traffic control frequencies at all times. Contractors and their personnel that do not have an Airport Security Badge must coordinate with the RPR or Airport Operations for an escort to access the AOA or SIDA. At no time shall active taxiways or runways be crossed by construction equipment without notification and proper clearance from the ATCT. The acquisition of two-way radio equipment shall be the responsibility of each party.

8.2.9 Maintaining the Secured Area of the Airport Security

The Airport is subject to Transportation Security Administration (TSA) regulations; therefore, security must be maintained at all times. The access points and haul routes identified on the Project phasing contained in *Attachment 1* are the only access points approved for use by the Contractor, subcontractors, and suppliers. When not actively in use, the gates shall be kept closed and locked. During periods of operation, the gate must be closed after each vehicle enters or departs, or a gate guard shall be posted at the access gates so that an inadvertent entry onto the Airport by an unauthorized vehicle and/or pedestrian is prevented.

Temporary fencing, gates, and other measures shall be installed as necessary. All security measures shall be coordinated with the Airport. Contractor shall be responsible for protection of the construction site and all work, materials, equipment, and existing facilities thereon

against vandals, wildlife, and all unauthorized persons. Security measures shall include additional security fencing, barricades, lighting, flagmen, and other measures as the Contractor may deem necessary to protect the site.

8.2.10 Airport Security Badge Requirements

Unless escorted by Airport Operations personnel or the RPR, each Contractor foreman or supervisory personnel working at a construction site inside the SIDA and AOA must obtain an Airport Security Badge. To qualify for an Airport Security Badge, personnel must possess two forms of identification, pass a criminal background check, and clear a security threat assessment. The Contractor will need to visit the Airport Badging Office for processing. The background process can take up to 30 days. The Contractor shall also complete an online airfield driving class and exam prior to receiving their badge. The Contractor must have all necessary individuals badged prior to the start of construction.

The badge must always be displayed on the outermost garment while inside the AOA. Failure to do so may result in criminal and civil penalties, revocation of the badge, and the individual being barred from the secure area. These measures will be enforced. Any security badge that is lost or stolen shall be immediately reported to Airport authorities. The fee for a replacement badge shall be the responsibility of the Contractor. All badges shall be returned to the Airport at the end of the Project.

The Project foreman and other badged supervisory personnel will be responsible for escorting their employees and material deliveries while on the job site, assuring that no breaches of the Airport security program occur. The construction area must be clearly spelled out on a diagram or map. The foreman will at all times be in direct control of all escorted personnel. Direct control shall include verbal or electronic communication and direct line of site with all personnel and equipment.

Contractor foreman shall be responsible for assuring that the construction site is secured at all times from unlawful intrusions by unauthorized individuals and / or vehicles at the end of each day by exercising security awareness and oversight and utilizing locking gates.

Failure to comply with the Airport's security program and TSA requirements and regulations may result in significant fines and removal of offending personnel.

9. WILDLIFE MANAGEMENT

The Contractor shall be required to remove all food and construction-related trash after each shift. The Contractor shall also ensure that their water supply tanks and lines are not leaking to prevent the attraction of birds or other animals to the site as a result of standing water.

10. FOREIGN OBJECT DEBRIS MANAGEMENT

Foreign Object Debris (FOD) management will be controlled by only allowing the Contractor's personnel to travel on the established haul routes. They will not be allowed to travel freely on the runway, taxiway, and apron system. The Contractor shall have a power vacuum sweeper available at all times when working on this Project. The Contractor shall continuously monitor and clean all haul routes and surrounding apron areas during their work shifts and at the direction of Airport Operations and the RPR. Airport Operations personnel will conduct inspections at the conclusion of each working day.

11. HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT

With the exception of fuel and other fluids for vehicles, there is no hazardous material associated with this Project. If the Contractor spills a small amount of fuel or other fluid, they shall immediately contain and remove it from the Airport and legally dispose of it.

If the Contractor spills any fuel or other fluid in excess of five gallons, Airport Operations personnel shall be immediately notified so that the Airport's spill procedures can be followed.

12. NOTIFICATION OF CONSTRUCTION ACTIVITIES

In order to maintain the desired levels of operational safety on airports during construction activities, Airport Operations personnel will follow the procedures listed below for the immediate notification of Airport Rescue and Fire Fighting (ARFF) personnel, Airport users, and the FAA of any condition adversely affecting operational safety during this Project.

12.1 List of Responsible Representatives (Project Directory)

Prior to the start of construction activities and after receipt of the Contractor's list of personnel, the RPR will compile a list of all stakeholders for the Project to include applicable points of contact for the Airport, RPR, and Contractor who will be permitted access to the work areas.

This Project Directory will include office contact phone numbers, e-mail addresses, and 24-hour emergency point of contact cell phone numbers. This list of critical phone numbers must be kept in all Contractor supervisor vehicles at all times. Airport Operations personnel shall also keep this list in their vehicles during the Project.

12.2 Notice to Air Missions (NOTAM) issuance

Airport personnel will issue all NOTAMs associated with this Project, in accordance with FAA AC 150/5200-28G, *Notices to Air Missions (NOTAMs) for Airport Operators*, as amended.

12.3 Emergency Notification Procedures

The County provides Fire and Police (Sheriff) response for the Airport. Contacting these services for an emergency shall be done by calling 911.

12.4 Coordination with Fire Department Personnel

ARFF and Airport administration personnel will be advised of daily construction activity via telephone, e-mail, or face-to-face meetings. Fire services will be minimally affected.

12.5 Notifications to the FAA

FAA Form 7460-1, *Notice of Proposed Construction or Alteration,* will be prepared and submitted by the Engineer.

The Airport must notify the appropriate FAA ATO Service Area Planning and Requirements Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs. Impacts to FAA equipment covered by a reimbursable agreement do not have to be reported by the Airport Operator. The Airport must coordinate work for FAA-owned NAVAIDs to be shutdown with the local FAA ATO / Technical Operations office and includes any necessary reimbursable agreements and flight checks. The Airport must provide a seven-day notice to schedule the actual shutdown.

13. INSPECTION REQUIREMENTS

The Contractor's personnel and County representatives will be responsible for conducting inspections of work areas to ensure that those areas are safe for aircraft operations.

13.1 Daily Inspections

Airport Operations personnel shall conduct a post-construction inspection at the end of each shift.

The Contractor shall be advised that Airport Operations will have the final authority to determine whether or not the Airport is safe for aircraft operations. Significant penalties have been established to ensure that the Contractor understands the seriousness of this issue.

Temporarily closed areas will only open after the Project area is complete. These areas will remain closed to all aircraft traffic from the time that construction in the Project area is started until it is completed and suitable for opening, as determined by Airport Operations personnel.

13.2 Final Inspections

A final inspection shall be conducted by the Airport prior to the commissioning of any newly constructed areas open to air traffic. The Airport will have the final authority in determining if the area is suitable for aircraft use.

14. UNDERGROUND UTILITIES

Known utilities are shown on the construction plans. The airfield electrical lines, communication lines, water lines, and storm drain utilities are within the Project limits. The Contractor must comply with California 811 / USA North requirements. There are utilities crossing the Airport and the Contractor is required to pothole at locations for existing utility conflicts. If in the unlikely event a utility is disrupted, the Contractor is responsible for contacting that utility company and requesting the repair.

15. PENALTIES

The Airport is operated in strict compliance with Federal Aviation Regulations required of a Part 139 Certificated Airport. If the Contractor's personnel fail to comply with any Airport rule or provision of this safety plan, the Project work will cease until the violation is corrected. Violation of the rules and regulations are subject to the Airport's enforcement policies and Notice of Violation incurred by the Contractor could induce penalties starting from $1,000 for a first offense and increasing for multiple offenses. The penalties also include the assessment of liquidated damages, in accordance with the contract, for failure to complete the Project on time.

16. SPECIAL CONDITIONS

The Project's haul route will be crossing an active apron as shown in *Attachment 1*. The Contractor shall monitor the apron at all times to ensure no vehicle is within 25 feet of a parked aircraft unless authorized by Airport Operations. No vehicle may use the designated haul route while an aircraft is operating on the apron. Airport Operations personnel will be required to monitor the ATCT frequency while on the construction site. If an aircraft alert is issued by an inbound aircraft, the Airport Operations personnel will contact the construction site supervisor and advise them on the correct safety procedures. The Project work area is anticipated to not be affected by aircraft movement except for the haul route.

Contractor vehicles shall stop and be inspected by Airport Operations prior to entering the SIDA. Contractor vehicles shall not enter the SIDA without proper Airport Approval. All Contractor personnel shall not enter SIDA

without Airport Approval. Personnel working within SIDA must be escorted by an authorized badge holder at all times.

17. RUNWAY AND TAXIWAY VISUAL AIDS

The Project will be located outside of all runway and taxiway safety areas. No runway or taxiway visual aids are anticipated for use on the Project.

18. MARKINGS AND SIGNS FOR ACCESS ROUTES

The Contractor will be required to submit a traffic control plan for his operations both on and off the Airport to the County for approval prior to the start of the work. The Contractor's approved traffic control plan will be distributed to all vehicle drivers working in the AOA and SIDA.

Routes will be marked by traffic cones or other devices, as approved by the Airport. See *Attachment 1* for additional information.

19. HAZARD MARKING AND LIGHTING

The CSPP depicts general locations of anticipated construction barricade locations to identify work limits during each phase of the Project and provide pilots with recognizable limits of potential hazards. Before starting work, Contractor to provide and have available all signs, barricades, and lights necessary for protection of the work. Install and maintain adequate warning signs and lighted barricades to protect property and personnel in the work area. Barricades will be weighted or anchored to prevent overturning from wind or aircraft engine blast.

Barricades located on aprons must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights. The County will provide a select amount of low-level barricades, marked with diagonal, alternating orange and white stripes, to separate all construction / maintenance areas from the movement areas listed above. Contractor shall coordinate with the Airport the number of low-profile barricades to be provided. For the barricades, the Contractor will provide red omni-directional flashers (two (2) per barricade) and an orange vinyl flag. Low-level barricades will be spaced a maximum of four (4) feet apart unless directed otherwise by the County.

The Contractor will have a person on call 24 hours a day for emergency maintenance of Airport hazard lighting and barricades. The Contractor must file the contact person's information with the County. Lighting will be checked for proper operation at least once per day, preferably at dusk.

Open trenches, excavations, or obstructions not being actively worked will be marked with lighted and weighted barricades that can be seen from a reasonable distance.

20. PROTECTION OF SAFETY AREAS, OBJECT FREE AREAS, AND APPROACH AND DEPARTURE SURFACES

Runway and taxiway safety areas, Obstacle Free Zones (OFZ), Object Free Areas (OFA), and Approach / Departure Surfaces are described in FAA AC 150/5300-13B. When working in these areas, construction will be limited in accordance with the Project specifications.

20.1 Runway Safety Area (RSA)

This Project does not require construction within the RSA.

20.2 Runway Object Free Area (ROFA)

This Project does not require construction within the ROFA.

20.3 Taxiway Safety Area (TSA)

This Project does not require construction within the TSA.

20.4 Taxiway Object Free Area (TOFA)

This Project does not require construction within the TOFA.

20.5 Obstacle Free Zones (OFZ)

This Project does not require construction within the OFZ.

20.6 Construction Activity in a Runway Approach / Departure Area

This Project does not require construction within the runway approach and departure surfaces.

20.7 Coordination of RSA / TSA Adjustments

This Project does not require RSA / TSA adjustments.

20.8 Blasting Operations

This Project does not require blasting operations.

20.9 Open Trenches or Excavations

Open trenches and excavations are anticipated during the Project. No open trenches, excavations, or stockpiled materials will be permitted outside of the Project work area.

20.10 Covering of Excavations

Excavations outside the Project work area that cannot be backfilled before the associated pavement is reopened must be covered with steel plates capable of supporting a 175,000-pound dual wheel aircraft load.

20.11 Marking of Open Trenches or Excavation

At the end of each working shift, the Contractor shall clearly mark open trenches or excavation areas with barricades, in accordance with Section 19.

20.12 Removal of Equipment

All construction equipment must be returned to the staging area/work area at the end of each shift or whenever the equipment is not in use.

20.13 Other Limitations on Construction

20.13.1 The Contractor must at all times conduct the work in conformance with requirements of the County and FAA.

20.13.2 The use of open flame welding or torches is prohibited unless fire safety precautions are provided and approved by the Airport.

20.13.3 The use of blasting caps is not applicable to this Project.

20.13.4 The use of flare pots is not applicable to this Project.

20.13.5 The Contractor shall at all times conduct their work in a manner that does not create any hindrance, hazard, or obstacle to aircraft using the Airport.

20.13.6 The Airport environment requires a high degree of care to control debris and dust. Spilled material on active roadways and aircraft parking aprons shall be swept up immediately.

20.13.7 Sanitary facilities must be provided by the Contractor for use by the Contractor's employees. Public facilities at the Airport are not to be used. Sanitary facilities must be located at the Contractor's staging area, unless otherwise approved by the Airport.

20.13.8 Contractor vehicles will obey all posted speed limits on Airport roadways. The maximum speed when operating inside the Airport perimeter fence is 15 mph maximum, consistent with safety.

20.13.9 All personnel operating a motor vehicle on Airport property shall have a valid state-issued driver's license.

20.13.10 Use of audio earphones and headsets are prohibited on the Airport unless directly related to job requirements.

20.13.11 Beacons and flags must be maintained in good working condition, and flags shall be replaced if they become faded, discolored, or ragged.

20.13.12 Lighted barricades shall be maintained, kept in good working order, and replaced if they are not operating properly.

21. SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) OVERVIEW

The Contractor is required to read, acknowledge, and abide by this CSPP. Additionally, all required information for compliance will not be available until a construction award for the Project has been made by the County. The following section provides for supplemental information and acknowledgement of the requirements of this CSPP. The Contractor shall not duplicate information in the subject requirements as contained in this CSPP, and if no supplemental information is needed shall enter "No Supplemental Information." The Contractor shall provide the information and execute the acknowledgement statement as part of his Project submittals. Additional guidance is contained in FAA AC 150/5370-2G.

22. CONTRACTOR CONTACT NUMBERS AND SUPPLEMENTAL INFORMATION

General Contractor: _____
Address: _____
_____
Office Phone: _____
Fax: _____

Contractor Personnel

TITLE	NAME	MOBILE PHONE
Project Manager:	_____	_____
Project Superintendent:	_____	_____
Safety Officer:	_____	_____

Construction Schedule

The Notice to Proceed (NTP) Date is: _____

The Official Start Date is: _____

The Project Duration is: _____

The Project Completion Date is: _____

Acknowledgement: I,_____, have read the **Outbound Baggage Improvements Project** Construction Safety and Phasing Plan, approved on _____, and will abide by it as written and with the following additions as noted.

Supplemental Information: (Insert "No Supplemental Information" if none is needed.)

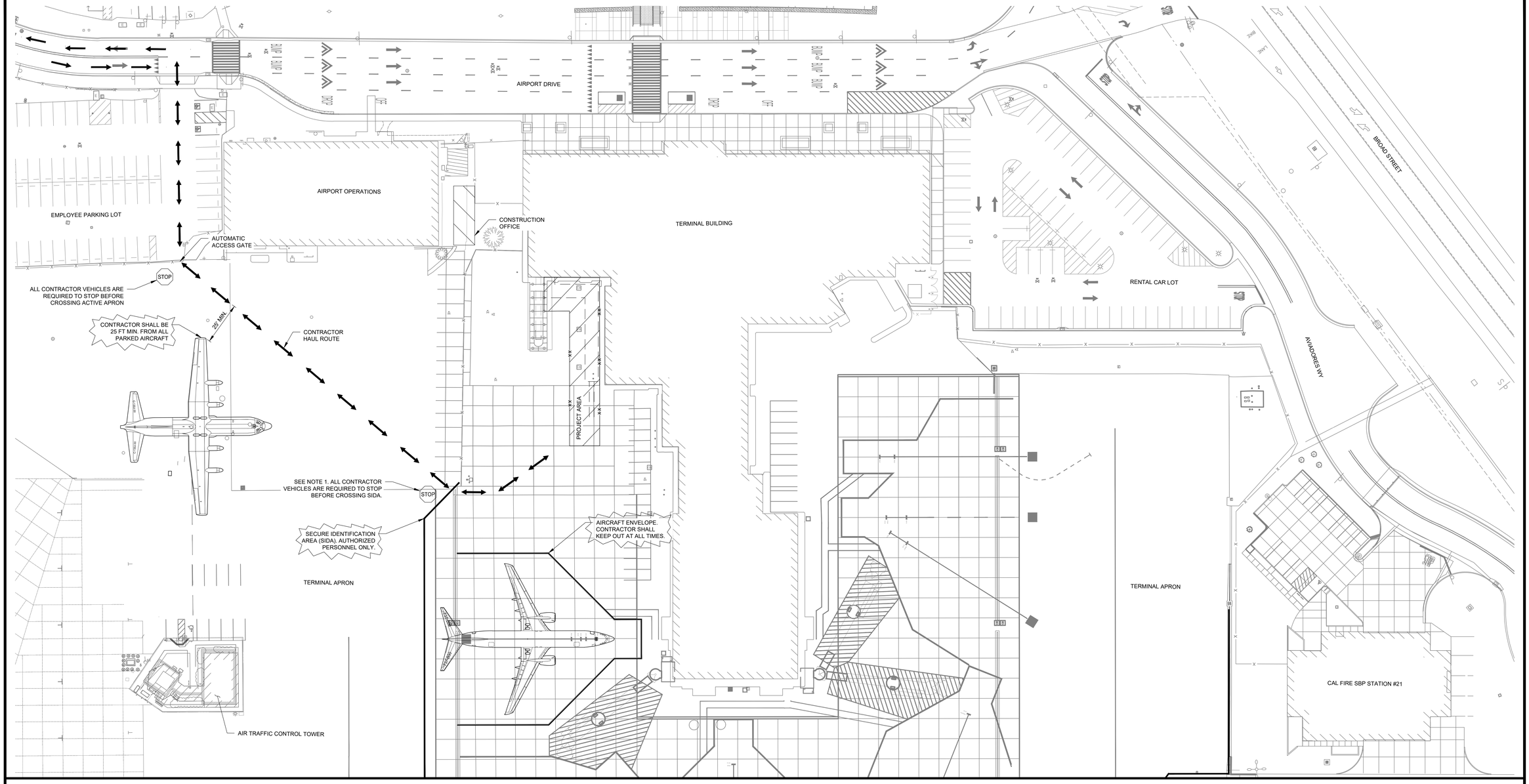
1. Coordination:
2. Phasing:
3. Areas and Operations Affected by Construction:
4. Protection of NAVAIDs:
5. Contractor Access:
6. Wildlife Management:
7. Foreign Object Debris (FOD) Management:
8. Hazardous Material (HAZMAT) Management:
9. Notification of Construction Activities:
10. Inspection Requirements:
11. Underground Utilities:
12. Penalties:
13. Special Conditions:
14. Runway and Taxiway Visual Aids:
15. Marking and Signs for Access Routes:
16. Hazard Marking and Lighting:
17. Protection of Runway and Taxiway Safety Areas, Object Free Areas Obstacle Free Areas:
18. Other Limitations on Construction:

ATTACHMENTS

ATTACHMENT 1

CONSTRUCTION SAFETY AND PHASING PLAN SHEETS

(Refer To Drawing Submittal)



CONSTRUCTION ACCESS NOTES:

1. ALL CONTRACTOR VEHICLES SHALL STOP AND BE INSPECTED BY AIRPORT OPERATIONS BEFORE ENTERING SIDA. CONTRACTOR VEHICLES SHALL NOT CROSS INTO SIDA WITHOUT PROPER AIRPORT APPROVAL.
2. ALL CONTRACTOR PERSONNEL SHALL NOT ENTER SIDA WITHOUT AIRPORT APPROVAL. PERSONNEL WORKING WITHIN SIDA MUST BE ESCORTED BY AN AUTHORIZED BADGE HOLDER AT ALL TIMES.
3. ARFF ACCESS SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL COORDINATE WITH AIRPORT TO CONFIRM APPROPRIATE ACCESS.
4. CONTRACTOR SHALL COORDINATE WITH AIRPORT FOR APRON ACCESS UNDER ACTIVE AIRCRAFT OPERATIONS.
5. BAGGAGE ACCESS FOR AIRLINE OPERATIONS SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL COORDINATE TEMPORARY BAGGAGE ACCESS WITH AIRPORT AND AIRLINE WORKERS.
6. CONTRACTOR SHALL REMAIN A MINIMUM OF 25 FEET AWAY FROM ALL PARKED AIRCRAFT. CONTRACTOR SHALL CONTACT AIRPORT OPERATIONS WITH ANY QUESTIONS OR CONCERNS.
7. CONTRACTOR SHALL REPAIR ALL ROUTES TO EXISTING CONDITION AS DETERMINED BY THE AIRPORT. REPAIRS TO BE INCIDENTAL TO CONSTRUCTION WORK.

CONSTRUCTION ACCESS LEGEND

- CONTRACTOR HAUL ROUTE
- PROJECT AREA
- CONSTRUCTION OFFICE
- LOW PROFILE BARRICADES
- x x — TEMPORARY CONSTRUCTION FENCE

0 30 60

Mead & Hunt

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phone: 909-467-8560
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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT

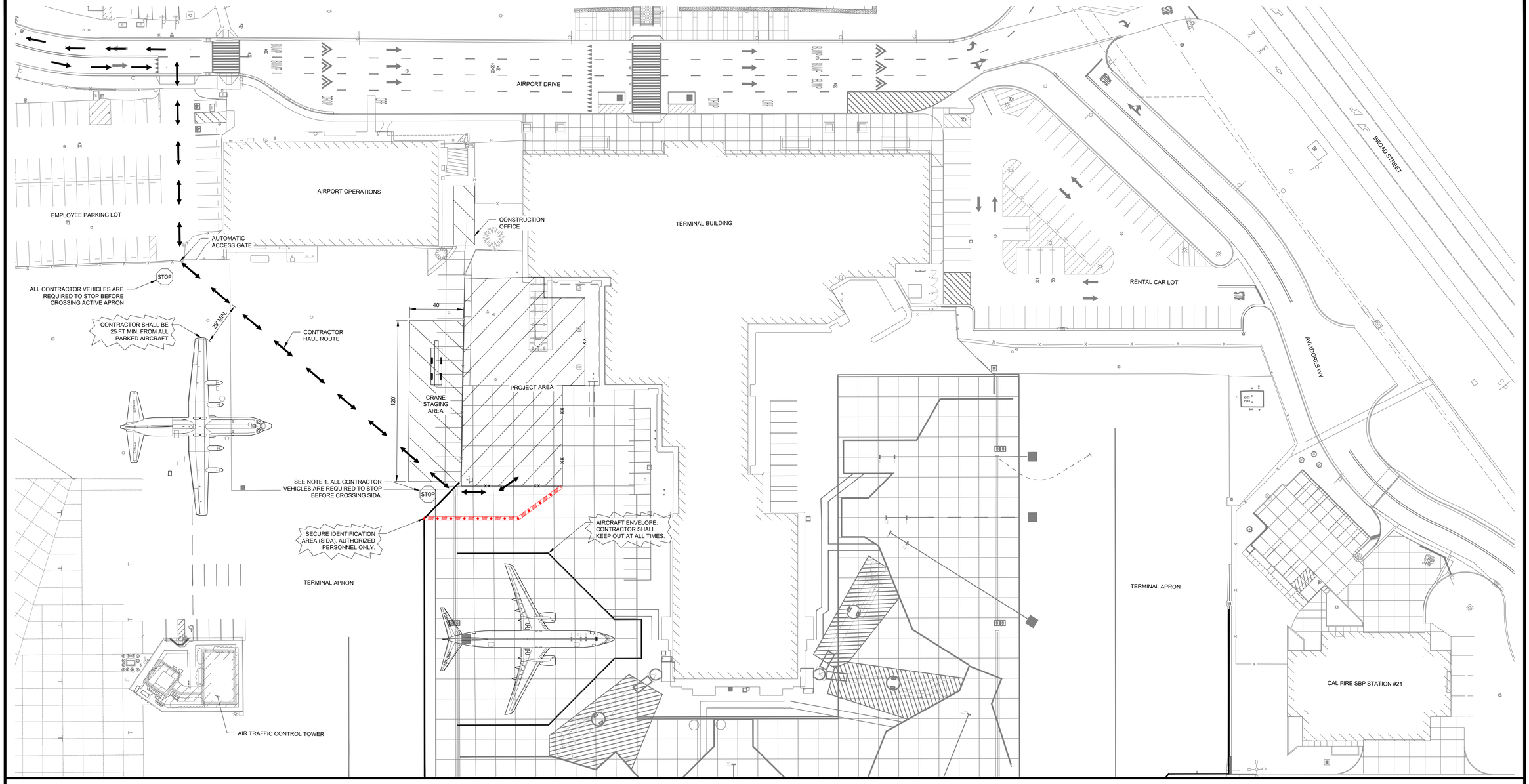
NOT FOR CONSTRUCTION

M&H NO.: 1943000-222814.02
DATE: September 3, 2025
DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RPG
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CONSTRUCTION ACCESS AND STAGING PLAN - PHASE 1

SHEET NO.
GC-081

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CONSTRUCTION ACCESS NOTES:

1. ALL CONTRACTOR VEHICLES SHALL STOP AND BE INSPECTED BY AIRPORT OPERATIONS BEFORE ENTERING SIDA. CONTRACTOR VEHICLES SHALL NOT CROSS INTO SIDA WITHOUT PROPER AIRPORT APPROVAL.
2. ALL CONTRACTOR PERSONNEL SHALL NOT ENTER SIDA WITHOUT AIRPORT APPROVAL. PERSONNEL WORKING WITHIN SIDA MUST BE ESCORTED BY AN AUTHORIZED BADGE HOLDER AT ALL TIMES.
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7. CONTRACTOR SHALL REPAIR ALL ROUTES TO EXISTING CONDITION AS DETERMINED BY THE AIRPORT. REPAIRS TO BE INCIDENTAL TO CONSTRUCTION WORK.

CONSTRUCTION ACCESS LEGEND

- CONTRACTOR HAUL ROUTE
- PROJECT AREA
- CRANE STAGING AREA
- LOW PROFILE BARRICADES
- xx TEMPORARY CONSTRUCTION FENCE

0 30 60

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT

NOT FOR CONSTRUCTION

M&H NO.: 1943000-222814.02
DATE: September 3, 2025
DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RPG
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CONSTRUCTION ACCESS AND STAGING PLAN - PHASE 2

SHEET NO.
GC-082

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ATTACHMENT 2

DAILY SAFETY INSPECTION CHECKLIST

(for Contractor's use)

CONTRACTOR'S
SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)
(AC 150/5370-2F)

Project Information

Airport and Sponsor: SLO County Airport, San Luis Obispo, San Luis Obispo County Department of Airports
Project ID: FAA AIP NO. 3-06-0228-XXX-202X
Description of Project: Baggage Screening Modifications
Type of Work: _____
FAA Project Manager: _____ Phone: _____
Airport Operator Contact: _____ Phone: _____

Contractor's Information

Prime Contractor: _____
Address: _____
Contractor Contact: _____ Phone: _____

Contractor's Responsibility

In accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5370-2F, *Operational Safety During Airport Construction,* a SPCD for a project must be submitted to the FAA and to the Airport Operator for review and approval prior to the issuance of a Notice-to-Proceed for Construction. The SPCD shall be prepared in a detailed written and graphical format that identifies the timing and methodology for the Contractor's compliance with the project's Construction Safety and Phasing Plan (CSPP).

The Contractor shall comply with all provisions contained herein and provide the following project-specific complementary and supplemental information to the FAA-approved Construction Safety and Phasing Plan:

1. Contractor shall have copies of the CSPP and SPCD available at all times for reference by the Airport Operator and its representatives, and by Contractor's and subcontractor's employees.

   Location(s) of CSPP and SPCD: _____
   _____

2. Provide contact information for the person responsible for initiating and coordinating an immediate response to correct any construction-related activity that may adversely affect the operational safety of the Airport. Project will require 24-hour coverage.

   Point of Contact: _____ Phone: _____

3. Provide list of Contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD whenever active construction is ongoing.

Contact Person: _____ Phone: _____
Contact Person: _____ Phone: _____
Contact Person: _____ Phone: _____
Contact Person: _____ Phone: _____

4. Contractor shall conduct inspections at least once daily, and more frequently if necessary to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards. A Construction Project Daily Safety Inspection Checklist is attached.

5. Describe details of Contractor's plan to restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate and as specified in the CSPP. Include the appropriate plan sheets to identify timing and/or location of control measures: [***Contractor to insert detailed description.]***

6. Describe details of Contractor's plan to ensure that no employees of Contractor, subcontractors, suppliers, or other persons enter any part of the Air Operations Area (AOA) unless authorized. [***Contractor to insert detailed description***.]

7. Provide a description and schedule of anticipated operation for all Contractor equipment over 15 feet in height (e.g. cranes, concrete pumps, other similarly tall equipment) and heights of stockpiles and haul routes when different from what is shown on previously filed CSPP. [***Contractor to insert detailed equipment list/stockpile heights as applicable.]***

(As necessary, the Contractor must coordinate with the Airport Operator for the purpose of filing a supplemental submittal of FAA Form 7460-1 to the FAA for determination of whether or not an aeronautical study must be conducted prior to allowing tall equipment operations to begin.)

8. Provide a description of Contractor's plan to ensure that construction personnel are familiar with the safety procedures and regulations on the Airport, the CSPP, and the SPCD. [***Contractor to insert detailed description.]***

SPCD Amendment

The SPCD shall be amended when there is a construction practice proposed by the Contractor that does not conform to the CSPP and SPCD and may impact the Airport's operational safety. This will require a revision to the CSPP and SPCD and re-coordination with the Airport Operator and the FAA in advance.

Statement of Certification

I certify that we understand the operational safety requirements of the CSPP and assert that we will not deviate from the approved CSPP and SPCD unless written approval is granted by the Airport Operator and FAA.

Print Name: _____ Title: _____

Signature: _____ Date: _____

DIVISION IV

FAA STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS

DIVISION VI - PART 1
FAA General Contract Provisions

Part 1 – General Contract Provisions

Section 10 Definition of Terms

When the following terms are used in these specifications, in the contract, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be defined as follows:

Paragraph Number	Term	Definition
10-01	**AASHTO**	The American Association of State Highway and Transportation Officials.
10-02	**Access Road**	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
10-03	**Advertisement**	A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.
10-04	**Airport**	Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.
10-05	**Airport Improvement Program (AIP)**	A grant-in-aid program, administered by the Federal Aviation Administration (FAA).
10-06	**Air Operations Area (AOA)**	The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.
10-07	**Apron**	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	**ASTM International (ASTM)**	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	**Award**	The Owner's notice to the successful bidder of the acceptance of the submitted bid.

Paragraph Number	Term	Definition
10-10	**Bidder**	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.
10-11	**Building Area**	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	**Calendar Day**	Every day shown on the calendar.
10-13	**Certificate of Analysis (COA)**	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	**Certificate of Compliance (COC)**	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	**Change Order**	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	**Contract**	A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment. The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.
10-17	**Contract Item (Pay Item)**	A specific unit of work for which a price is provided in the contract.
10-18	**Contract Time**	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.

Paragraph Number	Term	Definition
10-19	**Contractor**	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	**Contractors Quality Control (QC) Facilities**	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	**Contractor Quality Control Program (CQCP)**	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	**Control Strip**	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	**Construction Safety and Phasing Plan (CSPP)**	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	**Drainage System**	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	**Engineer**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	**Equipment**	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.
10-27	**Extra Work**	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.

Paragraph Number	Term	Definition
10-28	**FAA**	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	**Federal Specifications**	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.
10-30	**Force Account**	**a.** Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis. **b.** Owner Force Account - Work performed for the project by the Owner's employees.
10-31	**Intention of Terms**	Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.
10-32	**Lighting**	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	**Major and Minor Contract Items**	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	**Materials**	Any substance specified for use in the construction of the contract work.

Paragraph Number	Term	Definition
10-35	**Modification of Standards (MOS)**	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	**Notice to Proceed (NTP)**	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	**Owner**	The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is County of San Luis Obispo Department of Airports.
10-38	Passenger Facility Charge (PFC)	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	**Pavement Structure**	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	**Payment bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.
10-41	**Performance bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.
10-42	**Plans**	The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'
10-43	**Project**	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	**Proposal**	The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.

Paragraph Number	Term	Definition
10-45	**Proposal guaranty**	The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.
10-46	**Quality Assurance (QA)**	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	**Quality Control (QC)**	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	**Quality Assurance (QA) Inspector**	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	**Quality Assurance (QA) Laboratory**	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	**Resident Project Representative (RPR)**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.
10-51	**Runway**	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	**Runway Safety Area (RSA)**	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	**Safety Plan Compliance Document (SPCD)**	Details how the Contractor will comply with the CSPP.
10-54	**Specifications**	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.

Paragraph Number	Term	Definition
10-55	**Sponsor**	A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.
10-56	**Structures**	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	**Subgrade**	The soil that forms the pavement foundation.
10-58	**Superintendent**	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	**Supplemental Agreement**	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%: (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	**Surety**	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	**Taxilane**	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.
10-62	**Taxiway**	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.
10-63	**Taxiway/Taxilane Safety Area (TSA)**	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.

Paragraph Number	Term	Definition
10-64	**Work**	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	**Working day**	A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.
10-66	**Owner Defined terms**	None

END OF SECTION 10

Section 20 Proposal Requirements and Conditions

20-01 Advertisement (Notice to Bidders). See section titled Notice and Instructions to Bidders of the Contract Documents.

20-02 Qualification of bidders. Each bidder shall submit evidence of competency and evidence of financial responsibility to perform the work to the Owner at the time of bid opening.

Evidence of competency, unless otherwise specified, shall consist of statements covering the bidder's past experience on similar work, and a list of equipment and a list of key personnel that would be available for the work.

Each bidder shall furnish the Owner satisfactory evidence of their financial responsibility. Evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liabilities as of the last calendar year or the bidder's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the bidder shall further certify whether their financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect the bidder's true financial condition at the time such qualified statement or report is submitted to the Owner.

Unless otherwise specified, a bidder may submit evidence that they are prequalified with the State Highway Division and are on the current "bidder's list" of the state in which the proposed work is located. Evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports specified above.

20-03 Contents of proposal forms. The Owner's proposal forms state the location and description of the proposed construction; the place, date, and time of opening of the proposals; and the estimated quantities of the various items of work to be performed and materials to be furnished for which unit bid prices are asked. The proposal form states the time in which the work must be completed, and the amount of the proposal guaranty that must accompany the proposal. The Owner will accept only those Proposals properly executed on physical forms or electronic forms provided by the Owner. Bidder actions that may cause the Owner to deem a proposal irregular are given in paragraph 20-09 *Irregular proposals*.

Mobilization is limited to 10 percent of the total project cost.

20-04 Issuance of proposal forms. The Owner reserves the right to refuse to issue a proposal form to a prospective bidder if the bidder is in default for any of the following reasons:

a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement for bidding.

b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the proposal to a prospective bidder.

c. Documented record of Contractor default under previous contracts with the Owner.

d. Documented record of unsatisfactory work on previous contracts with the Owner.

20-05 Interpretation of estimated proposal quantities. An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be

increased or decreased as provided in the Section 40, paragraph 40-02, Alteration of Work and Quantities, without in any way invalidating the unit bid prices.

20-06 Examination of plans, specifications, and site. The bidder is expected to carefully examine the site of the proposed work, the proposal, plans, specifications, and contract forms. Bidders shall satisfy themselves to the character, quality, and quantities of work to be performed, materials to be furnished, and to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and is satisfied to the conditions to be encountered in performing the work and the requirements of the proposed contract, plans, and specifications.

20-07 Preparation of proposal. The bidder shall submit their proposal on the forms furnished by the Owner. All blank spaces in the proposal forms, unless explicitly stated otherwise, must be correctly filled in where indicated for each and every item for which a quantity is given. The bidder shall state the price (written in ink or typed) both in words and numerals which they propose for each pay item furnished in the proposal. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The bidder shall correctly sign the proposal in ink. If the proposal is made by an individual, their name and post office address must be shown. If made by a partnership, the name and post office address of each member of the partnership must be shown. If made by a corporation, the person signing the proposal shall give the name of the state where the corporation was chartered and the name, titles, and business address of the president, secretary, and the treasurer. Anyone signing a proposal as an agent shall file evidence of their authority to do so and that the signature is binding upon the firm or corporation.

20-08 Responsive and responsible bidder. A responsive bid conforms to all significant terms and conditions contained in the Owner's invitation for bid. It is the Owner's responsibility to decide if the exceptions taken by a bidder to the solicitation are material or not and the extent of deviation it is willing to accept.

A responsible bidder has the ability to perform successfully under the terms and conditions of a proposed procurement, as defined in 2 CFR § 200.318(h). This includes such matters as Contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.

20-09 Irregular proposals. Proposals shall be considered irregular for the following reasons:

a. If the proposal is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the proposal form is detached.

b. If there are unauthorized additions, conditional or alternate pay items, or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.

c. If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized alternate pay items, for which the bidder is not required to furnish a unit price.

d. If the proposal contains unit prices that are obviously unbalanced.

e. If the proposal is not accompanied by the proposal guaranty specified by the Owner.

f. If the applicable Disadvantaged Business Enterprise information is incomplete.

The Owner reserves the right to reject any irregular proposal and the right to waive technicalities if such waiver is in the best interest of the Owner and conforms to local laws and ordinances pertaining to the letting of construction contracts.

20-10 Bid guarantee. Each separate proposal shall be accompanied by a bid bond, certified check, or other specified acceptable collateral, in the amount specified in the proposal form. Such bond, check, or collateral, shall be made payable to the Owner.

20-11 Delivery of proposal. Each proposal submitted shall be placed in a sealed envelope plainly marked with the project number, location of airport, and name and business address of the bidder on the outside. When sent by mail, preferably registered, the sealed proposal, marked as indicated above, should be enclosed in an additional envelope. No proposal will be considered unless received at the place specified in the advertisement or as modified by Addendum before the time specified for opening all bids. Proposals received after the bid opening time shall be returned to the bidder unopened.

20-12 Withdrawal or revision of proposals. A bidder may withdraw or revise (by withdrawal of one proposal and submission of another) a proposal provided that the bidder's request for withdrawal is received by the Owner in writing before the time specified for opening bids. Revised proposals must be received at the place specified in the advertisement before the time specified for opening all bids.

20-13 Public opening of proposals. Proposals shall be opened, and read, publicly at the time and place specified in the advertisement. Bidders, their authorized agents, and other interested persons are invited to attend. Proposals that have been withdrawn (by written or telegraphic request) or received after the time specified for opening bids shall be returned to the bidder unopened.

20-14 Disqualification of bidders. A bidder shall be considered disqualified for any of the following reasons:

a. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.

b. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.

c. If the bidder is considered to be in "default" for any reason specified in paragraph 20-04, *Issuance of Proposal Forms,* of this section.

20-15 Discrepancies and Omissions. A Bidder who discovers discrepancies or omissions with the project bid documents shall immediately notify the Owner's Engineer of the matter. A bidder that has doubt as to the true meaning of a project requirement may submit to the Owner's Engineer a written request for interpretation no later than 7 days prior to bid opening.

Any interpretation of the project bid documents by the Owner's Engineer will be by written addendum issued by the Owner. The Owner will not consider any instructions, clarifications or interpretations of the bidding documents in any manner other than written addendum.

END OF SECTION 20

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Section 30 Award and Execution of Contract

30-01 Consideration of proposals. After the proposals are publicly opened and read, they will be compared on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices. If a bidder's proposal contains a discrepancy between unit bid prices written in words and unit bid prices written in numbers, the unit bid price written in words shall govern.

Until the award of a contract is made, the Owner reserves the right to reject a bidder's proposal for any of the following reasons:

a. If the proposal is irregular as specified in Section 20, paragraph 20-09, *Irregular Proposals*.

b. If the bidder is disqualified for any of the reasons specified Section 20, paragraph 20-14, *Disqualification of Bidders*.

In addition, until the award of a contract is made, the Owner reserves the right to reject any or all proposals, waive technicalities, if such waiver is in the best interest of the Owner and is in conformance with applicable state and local laws or regulations pertaining to the letting of construction contracts; advertise for new proposals; or proceed with the work otherwise. All such actions shall promote the Owner's best interests.

30-02 Award of contract. The award of a contract, if it is to be awarded, shall be made within 120 calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

If the Owner elects to proceed with an award of contract, the Owner will make award to the responsible bidder whose bid, conforming with all the material terms and conditions of the bid documents, is the lowest in price.

30-03 Cancellation of award. The Owner reserves the right to cancel the award without liability to the bidder, except return of proposal guaranty, at any time before a contract has been fully executed by all parties and is approved by the Owner in accordance with paragraph 30-07 *Approval of Contract*.

30-04 Return of proposal guaranty. All proposal guaranties, except those of the two lowest bidders, will be returned immediately after the Owner has made a comparison of bids as specified in the paragraph 30-01, *Consideration of Proposals.* Proposal guaranties of the two lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidder's proposal guaranty will be returned. The successful bidder's proposal guaranty will be returned as soon as the Owner receives the contract bonds as specified in paragraph 30-05, *Requirements of Contract Bonds.*

30-05 Requirements of contract bonds. At the time of the execution of the contract, the successful bidder shall furnish the Owner a surety bond or bonds that have been fully executed by the bidder and the surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred by reason of the Contractor's performance of the work. The surety and the form of the bond or bonds shall be acceptable to the Owner. Unless otherwise specified in this subsection, the surety bond or bonds shall be in a sum equal to the full amount of the contract.

30-06 Execution of contract. The successful bidder shall sign (execute) the necessary agreements for entering into the contract and return the signed contract to the Owner, along with the fully executed surety bond or bonds specified in paragraph 30-05, *Requirements of Contract Bonds,* of this section, within 15 calendar days from the date mailed or otherwise delivered to the successful bidder.

30-07 Approval of contract. Upon receipt of the contract and contract bond or bonds that have been executed by the successful bidder, the Owner shall complete the execution of the contract in accordance with local laws or ordinances, and return the fully executed contract to the Contractor. Delivery of the fully executed contract to the Contractor shall constitute the Owner's approval to be bound by the successful bidder's proposal and the terms of the contract.

30-08 Failure to execute contract. Failure of the successful bidder to execute the contract and furnish an acceptable surety bond or bonds within the period specified in paragraph 30-06, *Execution of Contract,* of this section shall be just cause for cancellation of the award and forfeiture of the proposal guaranty, not as a penalty, but as liquidated damages to the Owner.

END OF SECTION 30

Section 40 Scope of Work

40-01 Intent of contract. The intent of the contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

40-02 Alteration of work and quantities. The Owner reserves the right to make such changes in quantities and work as may be necessary or desirable to complete, in a satisfactory manner, the original intended work. Unless otherwise specified in the Contract, the Owner's Engineer or RPR shall be and is hereby authorized to make, in writing, such in-scope alterations in the work and variation of quantities as may be necessary to complete the work, provided such action does not represent a significant change in the character of the work.

For purpose of this section, a significant change in character of work means: any change that is outside the current contract scope of work; any change (increase or decrease) in the total contract cost by more than 25%; or any change in the total cost of a major contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of work shall not invalidate the contract nor release the surety. Contractor agrees to accept payment for such work alterations and quantity variances in accordance with Section 90, paragraph 90-03, *Compensation for Altered Quantities*.

Should the value of altered work or quantity variance meet the criteria for significant change in character of work, such altered work and quantity variance shall be covered by a supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the Owner reserves the right to terminate the contract with respect to the item and make other arrangements for its completion.

40-03 Omitted items. The Owner, the Owner's Engineer or the RPR may provide written notice to the Contractor to omit from the work any contract item that does not meet the definition of major contract item. Major contract items may be omitted by a supplemental agreement. Such omission of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with Section 90, paragraph 90-04, *Payment for Omitted Items*.

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for Extra Work*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to

establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

Any claim for payment of extra work that is not covered by written agreement (change order or supplemental agreement) shall be rejected by the Owner.

40-05 Maintenance of traffic. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.

b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).

c. When the contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (http://mutcd.fhwa.dot.gov/), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Resident Project Representative (RPR) shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the RPR in accordance with the provisions of the contract.

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,

b. Remove such material from the site, upon written approval of the RPR; or

c. Use such material for the Contractor's own temporary construction on site; or,

d. Use such material as intended by the terms of the contract.

Should the Contractor wish to exercise option a., b., or c., the Contractor shall request the RPR's approval in advance of such use.

Should the RPR approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the contract work. The Contractor shall not be charged for use of such material used in the work or removed from the site.

Should the RPR approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable contract price, for furnishing and installing such material in accordance with requirements of the contract item in which the material is used.

It is understood and agreed that the Contractor shall make no claim for delays by reason of their own exercise of option a., b., or c.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the work, except where such excavation or removal is provided for in the contract, plans, or specifications.

40-08 Final cleanup. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of the property Owner.

END OF SECTION 40

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Section 50 Control of Work

50-01 Authority of the Resident Project Representative (RPR). The RPR has final authority regarding the interpretation of project specification requirements. The RPR shall determine acceptability of the quality of materials furnished, method of performance of work performed, and the manner and rate of performance of the work. The RPR does not have the authority to accept work that does not conform to specification requirements.

50-02 Conformity with plans and specifications. All work and all materials furnished shall be in reasonably close conformity with the lines, grades, grading sections, cross-sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the contract, plans, or specifications.

If the RPR finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications, but that the portion of the work affected will, in their opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, the RPR will advise the Owner of their determination that the affected work be accepted and remain in place. The RPR will document the determination and recommend to the Owner a basis of acceptance that will provide for an adjustment in the contract price for the affected portion of the work. Changes in the contract price must be covered by contract change order or supplemental agreement as applicable.

If the RPR finds the materials furnished, work performed, or the finished product are not in reasonably close conformity with the plans and specifications and have resulted in an unacceptable finished product, the affected work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in accordance with the RPR's written orders.

The term "reasonably close conformity" shall not be construed as waiving the Contractor's responsibility to complete the work in accordance with the contract, plans, and specifications. The term shall not be construed as waiving the RPR's responsibility to insist on strict compliance with the requirements of the contract, plans, and specifications during the Contractor's execution of the work, when, in the RPR's opinion, such compliance is essential to provide an acceptable finished portion of the work.

The term "reasonably close conformity" is also intended to provide the RPR with the authority, after consultation with the Sponsor and FAA, to use sound engineering judgment in their determinations to accept work that is not in strict conformity, but will provide a finished product equal to or better than that required by the requirements of the contract, plans and specifications.

The RPR will not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions incident thereto.

50-03 Coordination of contract, plans, and specifications. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

From time to time, discrepancies within cited testing standards occur due to the timing of the change, edits, and/or replacement of the standards. If the Contractor discovers any apparent discrepancy within standard

test methods, the Contractor shall immediately ask the RPR for an interpretation and decision, and such decision shall be final.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, Contractor shall immediately notify the Owner or the designated representative in writing requesting their written interpretation and decision.

50-04 List of Special Provisions.

ORDER OF PRECEDENCE

As indicated in the County's General Conditions:

In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following order of precedence:

1. Permits and other government approval
2. Change Orders and Construction Change Directives, issued after execution of the Agreement
3. Agreement
4. Project-Specific Requirements for Airport Construction
5. FAA Technical Specifications
6. FAA General Construction Items
7. Required Federal Provisions
8. Special Provisions
9. Project Plans
10. General Conditions
11. FAA General Contract Provisions
12. Revised Standard Specifications that are included in the Contract Documents
13. Standard Specifications
14. Revised Standard Plans that are included in the Contract Documents
15. Standard Plans
16. Cited FAA Advisory Circulars
17. Cited Standards for Materials and Testing
18. Bidding Documents
19. Supplemental Project Information

50-05 Cooperation of Contractor. The Contractor shall be supplied with five hard copies or an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hardcopy each of the plans and specifications. Additional hard copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.

The Contractor shall give constant attention to the work to facilitate the progress thereof, and shall cooperate with the RPR and their inspectors and with other Contractors in every way possible. The Contractor shall have a competent superintendent on the work at all times who is fully authorized as their agent on the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the RPR or their authorized representative.

50-06 Cooperation between Contractors. The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct the work not to interfere with or hinder the progress of completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with their own contract and shall protect and hold harmless the Owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange their work and shall place and dispose of the materials being used to not interfere with the operations of the other Contractors within the limits of the same project. The Contractor shall join their work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

50-07 Construction layout and stakes. The Engineer/RPR shall establish necessary horizontal and vertical control. The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving integrity of horizontal and vertical controls established by Engineer/RPR. In case of negligence on the part of the Contractor or their employees, resulting in the destruction of any horizontal and vertical control, the resulting costs will be deducted as a liquidated damage against the Contractor.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the RPR that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the work on this project will be provided to the RPR. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format(s): AutoCAD Civil 3D Drawings – Version 2024, PNEZD csv files, and stamped survey PDF drawings.

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in contract documents, for this labor, materials, or other expenses. The cost shall be included in the price of the bid for the various items of the Contract.

50-08 Authority and duties of Quality Assurance (QA) inspectors. QA inspectors shall be authorized to inspect all work done and all material furnished. Such QA inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. QA inspectors are not authorized to revoke, alter, or waive any provision of the contract. QA inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

QA Inspectors are authorized to notify the Contractor or their representatives of any failure of the work or materials to conform to the requirements of the contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the RPR for a decision.

50-09 Inspection of the work. All materials and each part or detail of the work shall be subject to inspection. The RPR shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

If the RPR requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor's expense.

Provide advance written notice to the RPR of work the Contractor plans to perform each week and each day. Any work done or materials used without written notice and allowing opportunity for inspection by the RPR may be ordered removed and replaced at the Contractor's expense.

Should the contract work include relocation, adjustment, or any other modification to existing facilities, not the property of the (contract) Owner, authorized representatives of the Owners of such facilities shall have the right to inspect such work. Such inspection shall in no sense make any facility owner a party to the contract, and shall in no way interfere with the rights of the parties to this contract.

50-10 Removal of unacceptable and unauthorized work. All work that does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise determined acceptable by the RPR as provided in paragraph 50-02, *Conformity with Plans and Specifications*.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of Section 70, paragraph 70-14, *Contractor's Responsibility for Work*.

No removal work made under provision of this paragraph shall be done without lines and grades having been established by the RPR. Work done contrary to the instructions of the RPR, work done beyond the lines shown on the plans or as established by the RPR, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the RPR made under the provisions of this subsection, the RPR will have authority to cause unacceptable work to be remedied or removed and replaced; and unauthorized work to be removed and recover the resulting costs as a liquidated damage against the Contractor.

50-11 Load restrictions. The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor, at their own expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel.

50-12 Maintenance during construction. The Contractor shall maintain the work during construction and until the work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various contract items, and the Contractor will not be paid an additional amount for such work.

50-13 Failure to maintain the work. Should the Contractor at any time fail to maintain the work as provided in paragraph 50-12, *Maintenance during Construction*, the RPR shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

Should the Contractor fail to respond to the RPR's notification, the Owner may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner, shall be recovered as a liquidated damage against the Contractor.

50-14 Partial acceptance. If at any time during the execution of the project the Contractor substantially completes a usable unit or portion of the work, the occupancy of which will benefit the Owner, the Contractor may request the RPR to make final inspection of that unit. If the RPR finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, the RPR may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract.

50-15 Final acceptance. Upon due notice from the Contractor of presumptive completion of the entire project, the RPR and Owner will make an inspection. If all construction provided for and contemplated by the contract is found to be complete in accordance with the contract, plans, and specifications, such inspection shall constitute the final inspection. The RPR shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the RPR will notify the Contractor and the Contractor shall correct the unsatisfactory work. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the RPR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

50-16 Claims for adjustment and disputes. If for any reason the Contractor deems that additional compensation is due for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the RPR in writing of their intention to claim such additional compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the RPR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the RPR has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the Contractor's right to dispute final payment based on differences in measurements or computations.

END OF SECTION 50

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Section 60 Control of Materials

60-01 Source of supply and quality requirements. The materials used in the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish documentation to the RPR as to the origin, composition, and manufacture of all materials to be used in the work. Documentation shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

At the RPR's option, materials may be approved at the source of supply before delivery. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

The Contractor shall furnish airport lighting equipment that meets the requirements of the specifications; and is listed in AC 150/5345-53, *Airport Lighting Equipment Certification Program* and *Addendum*, that is in effect on the date of advertisement.

60-02 Samples, tests, and cited specifications. All materials used in the work shall be inspected, tested, and approved by the RPR before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the RPR shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the RPR, shall be removed at the Contractor's expense.

Unless otherwise designated, quality assurance tests will be made by and at the expense of the Owner in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), federal specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids.

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the RPR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the RPR.

A copy of all Contractor QC test data shall be provided to the RPR daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the RPR showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not.

The form and distribution of certificates of compliance shall be as approved by the RPR.

When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the specified "or equal," the Contractor shall be required to furnish the manufacturer's certificate of compliance

for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

a. Conformance to the specified performance, testing, quality or dimensional requirements; and,

b. Suitability of the material or assembly for the use intended in the contract work.

The RPR shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The RPR reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

60-04 Plant inspection. The RPR or their authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for acceptance of the material or assembly.

Should the RPR conduct plant inspections, the following conditions shall exist:

a. The RPR shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.

b. The RPR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

c. If required by the RPR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Place office or working space in a convenient location with respect to the plant.

It is understood and agreed that the Owner shall have the right to retest any material that has been tested and approved at the source of supply after it has been delivered to the site. The RPR shall have the right to reject only material which, when retested, does not meet the requirements of the contract, plans, or specifications.

60-05 Engineer/ Resident Project Representative (RPR) field office. An Engineer/RPR field office is not required.

60-06 Storage of materials. Materials shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the RPR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans and/or CSPP, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the RPR. Private property shall not be used for storage purposes without written permission of the Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the RPR a copy of the property Owner's permission.

All storage sites on private or airport property shall be restored to their original condition by the Contractor at their expense, except as otherwise agreed to (in writing) by the Owner or lessee of the property.

60-07 Unacceptable materials. Any material or assembly that does not conform to the requirements of the contract, plans, or specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the RPR.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the RPR has approved its use in the work.

60-08 Owner furnished materials. The Contractor shall furnish all materials required to complete the work, except those specified, if any, to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified.

All costs of handling, transportation from the specified location to the site of work, storage, and installing Owner-furnished materials shall be included in the unit price bid for the contract item in which such Owner-furnished material is used.

After any Owner-furnished material has been delivered to the location specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies that may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

END OF SECTION 60

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Section 70 Legal Regulations and Responsibility to Public

70-01 Laws to be observed. The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

70-02 Permits, licenses, and taxes. The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work.

70-03 Patented devices, materials, and processes. If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the Patentee or Owner. The Contractor and the surety shall indemnify and hold harmless the Owner, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the execution or after the completion of the work.

70-04 Restoration of surfaces disturbed by others. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) must be shown on the plans and is indicated as follows: Not Applicable.

Except as listed above, the Contractor shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the work without the written permission of the RPR.

Should the Owner of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the Contractor shall cooperate with such Owners by arranging and performing the work in this contract to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the RPR, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

70-05 Federal Participation. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

70-06 Sanitary, health, and safety provisions. The Contractor's worksite and facilities shall comply with applicable federal, state, and local requirements for health, safety and sanitary provisions.

70-07 Public convenience and safety. The Contractor shall control their operations and those of their subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40, paragraph 40-05, *Maintenance of Traffic,* and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-04, *Limitation of Operations*.

The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the RPR. If the RPR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the RPR reserves the right to assign the task of debris removal to a third party and recover the resulting costs as a liquidated damage against the Contractor.

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is on sheet(s) G-081 through G-085 of the project plans.

70-09 Use of explosives. The use of explosives is not permitted on this project

70-10 Protection and restoration of property and landscape. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer/RPR has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the execution of the work, resulting from any act, omission, neglect, or misconduct in manner or method of executing the work, or at any time due to defective work or materials, and said responsibility shall not be released until the project has been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, the Contractor shall restore, at their expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

70-11 Responsibility for damage claims. The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act," or any other law, ordinance, order, or decree. Money due the Contractor under and by virtue of their own contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, their own surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.

70-12 Third party beneficiary clause. It is specifically agreed between the parties executing the contract that it is not intended by any of the provisions of any part of the contract to create for the public or any member thereof, a third-party beneficiary or to authorize anyone not a party to the contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the contract.

70-13 Opening sections of the work to traffic. If it is necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such "phasing" of the work must be specified below and indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified in the CSPP.

Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-14, *Partial Acceptance*.

No portion of the work may be opened by the Contractor until directed by the Owner in writing. Should it become necessary to open a portion of the work to traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the RPR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at their expense.

The Contractor shall make their own estimate of the inherent difficulties involved in completing the work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the contract work.

The Contractor must conform to safety standards contained AC 150/5370-2 and the approved CSPP.

Contractor shall refer to the plans, specifications, and the approved CSPP to identify barricade requirements, temporary and/or permanent markings, airfield lighting, guidance signs and other safety requirements prior to opening up sections of work to traffic.

70-14 Contractor's responsibility for work. Until the RPR's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-14, *Partial Acceptance*, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at their own expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding, and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-15 Contractor's responsibility for utility service and facilities of others. As provided in paragraph 70-04, *Restoration of Surfaces Disturbed by Others*, the Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control their operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans and/or in the contract documents.

- **Electric** – *PG&E 1-800-468-4743*
- **Gas** – *PG&E 1-800-468-4743*
- **Water** – *Oceano Community Services District (OCSD) 805-481-6730*
- **Sewer** – *Oceano Community Services District (OCSD) 805-481-6730*
- **Underground FAA Electrical Cable**
  - *Federal Aviation Administration 202-267-3366*
- **Underground Airfield Electrical Cable and Lighting**
  - *San Luis Obispo County Airport 805-781-5205*

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of the responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing addressed to "The Person to Contact" as provided in this paragraph and paragraph 70-04, *Restoration of Surfaces Disturbed By Others*. A copy of each notification shall be given to the RPR.

In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's "Person to Contact" no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the RPR.

The Contractor's failure to give the two days' notice shall be cause for the Owner to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use hand excavation methods within 3 feet (1 m) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, the Contractor shall immediately notify the proper authority and the RPR and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the RPR continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to their operations whether due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or their own surety.

70-16 Furnishing rights-of-way. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-17 Personal liability of public officials. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, RPR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

70-18 No waiver of legal rights. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.

70-19 Environmental protection. The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-20 Archaeological and historical findings. Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the RPR. The RPR will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in Section 40, paragraph 40-04, *Extra Work,* and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Insurance Requirements. See Article 7 – Insurance Requirements in the Notice and Instructions to Bidders.

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Section 80 Execution and Progress

80-01 Subletting of contract. The Owner will not recognize any subcontractor on the work. The Contractor shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the Resident Project Representative (RPR).

The Contractor shall perform, with his organization, an amount of work equal to at least 30 percent of the total contract cost.

Should the Contractor elect to assign their contract, said assignment shall be concurred in by the surety, shall be presented for the consideration and approval of the Owner, and shall be consummated only on the written approval of the Owner.

The Contractor shall provide copies of all subcontracts to the RPR 14 days prior to being utilized on the project. As a minimum, the information shall include the following:

- Subcontractor's legal company name.
- Subcontractor's legal company address, including County name.
- Principal contact person's name, telephone and fax number.
- Complete narrative description, and dollar value of the work to be performed by the subcontractor.
- Copies of required insurance certificates in accordance with the specifications.
- Minority/ non-minority status.

80-02 Notice to proceed (NTP). The Owners notice to proceed will state the date on which contract time commences. The Contractor is expected to commence project operations within 10 days of the NTP date. The Contractor shall notify the RPR at least 24 hours in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.

80-03 Execution and progress. Unless otherwise specified, the Contractor shall submit their coordinated construction schedule showing all work activities for the RPR's review and acceptance at least 10 days prior to the start of work. The Contractor's progress schedule, once accepted by the RPR, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The RPR will compare actual Contractor progress against the baseline schedule to determine that status of the Contractor's performance. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the proposal.

If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the RPR's request, submit a revised schedule for completion of the work within the contract time and modify their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the RPR at least 24 hours in advance of resuming operations.

The Contractor shall not commence any actual construction prior to the date on which the NTP is issued by the Owner.

The project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include information on the sequence of work activities, milestone dates, and activity duration. The schedule shall

show all work items identified in the project proposal for each work area and shall include the project start date and end date.

The Contractor shall maintain the work schedule and provide an update and analysis of the progress schedule on a twice monthly basis, or as otherwise specified in the contract. Submission of the work schedule shall not relieve the Contractor of overall responsibility for scheduling, sequencing, and coordinating all work to comply with the requirements of the contract.

80-04 Limitation of operations. The Contractor shall control their operations and the operations of their subcontractors and all suppliers to provide for the free and unobstructed movement of aircraft in the air operations areas (AOA) of the airport.

When the work requires the Contractor to conduct their operations within an AOA of the airport, the work shall be coordinated with airport operations (through the RPR) at least 48 hours prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the RPR and until the necessary temporary marking, signage and associated lighting is in place as provided in Section 70, paragraph 70-08, *Construction Safety and Phasing Plan (CSPP)*.

When the contract work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; and immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) and as listed below, cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently. Refer to the CSPP for specific requirements.

The Contractor shall be required to conform to safety standards contained in AC 150/5370-2, Operational Safety on Airports During Construction and the approved CSPP.

80-04.1 Operational safety on airport during construction. All Contractors' operations shall be conducted in accordance with the approved project Construction Safety and Phasing Plan (CSPP) and the Safety Plan Compliance Document (SPCD) and the provisions set forth within the current version of AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a SPCD that details how it proposes to comply with the requirements presented within the CSPP.

The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks to assure compliance with the safety plan measures.

The Contractor is responsible to the Owner for the conduct of all subcontractors it employs on the project. The Contractor shall assure that all subcontractors are made aware of the requirements of the CSPP and SPCD and that they implement and maintain all necessary measures.

No deviation or modifications may be made to the approved CSPP and SPCD unless approved in writing by the Owner. The necessary coordination actions to review Contractor proposed modifications to an approved CSPP or approved SPCD can require a significant amount of time.

80-05 Character of workers, methods, and equipment. The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the contract, plans, and specifications.

All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.

Any person employed by the Contractor or by any subcontractor who violates any operational regulations or operational safety requirements and, in the opinion of the RPR, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the RPR, be removed immediately by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the work without approval of the RPR.

Should the Contractor fail to remove such person or persons, or fail to furnish suitable and sufficient personnel for the proper execution of the work, the RPR may suspend the work by written notice until compliance with such orders.

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall not cause injury to previously completed work, adjacent property, or existing airport facilities due to its use.

When the methods and equipment to be used by the Contractor in accomplishing the work are not prescribed in the contract, the Contractor is free to use any methods or equipment that will accomplish the work in conformity with the requirements of the contract, plans, and specifications.

When the contract specifies the use of certain methods and equipment, such methods and equipment shall be used unless otherwise authorized by the RPR. If the Contractor desires to use a method or type of equipment other than specified in the contract, the Contractor may request authority from the RPR to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the RPR determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the RPR may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this paragraph.

80-06 Temporary suspension of the work. The Owner shall have the authority to suspend the work wholly, or in part, for such period or periods the Owner may deem necessary, due to unsuitable weather, or other conditions considered unfavorable for the execution of the work, or for such time necessary due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the contract.

In the event that the Contractor is ordered by the Owner, in writing, to suspend work for some unforeseen cause not otherwise provided for in the contract and over which the Contractor has no control, the Contractor may be reimbursed for actual money expended on the work during the period of shutdown. No allowance will be made for anticipated profits. The period of shutdown shall be computed from the effective date of the written order to suspend work to the effective date of the written order to resume the work. Claims for such compensation shall be filed with the RPR within the time period stated in the RPR's order to resume work. The Contractor shall submit with their own claim information substantiating the amount shown on the claim. The RPR will forward the Contractor's claim to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the contract, plans, or specifications.

If it becomes necessary to suspend work for an indefinite period, the Contractor shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. The Contractor shall take every precaution to prevent damage or deterioration of the work performed and provide for

normal drainage of the work. The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

80-07 Determination and extension of contract time. The number of calendar days shall be stated in the proposal and contract and shall be known as the Contract Time.

If the contract time requires extension for reasons beyond the Contractor's control, it shall be adjusted as follows:

80-07.1 Contract time based on calendar days. Contract Time based on calendar days shall consist of the number of calendar days stated in the contract counting from the effective date of the Notice to Proceed and including all Saturdays, Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.

At the time of final payment, the contract time shall be increased in the same proportion as the cost of the actually completed quantities bears to the cost of the originally estimated quantities in the proposal. Such increase in the contract time shall not consider either cost of work or the extension of contract time that has been covered by a change order or supplemental agreement. Charges against the contract time will cease as of the date of final acceptance.

80-08 Failure to complete on time. For each calendar day or working day, as specified in the contract, that any work remains uncompleted after the contract time (including all extensions and adjustments as provided in paragraph 80-07, *Determination and Extension of Contract Time*) the sum specified in the contract and proposal as liquidated damages (LD) will be deducted from any money due or to become due the Contractor or their own surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages including but not limited to additional engineering services that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in their contract. See Division 3, Part 1, SP-100, Special Provisions for Airport Construction, Section 100-1.14 and 1.15 for schedule of liquidated damages.

The maximum construction time allowed for Phase 1 is seven (7) calendar days and Phase 2 is two (2) calendar days. Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a wavier on the part of the Owner of any of its rights under the contract.

80-09 Default and termination of contract. The Contractor shall be considered in default of their contract and such default will be considered as cause for the Owner to terminate the contract for any of the following reasons, if the Contractor:

a. Fails to begin the work under the contract within the time specified in the Notice to Proceed, or

b. Fails to perform the work or fails to provide sufficient workers, equipment and/or materials to assure completion of work in accordance with the terms of the contract, or

c. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

d. Discontinues the execution of the work, or

e. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or

f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or

g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or

h. Makes an assignment for the benefit of creditors, or

i. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

Should the Owner consider the Contractor in default of the contract for any reason above, the Owner shall immediately give written notice to the Contractor and the Contractor's surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the contract.

If the Contractor or surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will, upon written notification from the RPR of the facts of such delay, neglect, or default and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the execution of the work out of the hands of the Contractor. The Owner may appropriate or use any or all materials and equipment that have been mobilized for use in the work and are acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as in the opinion of the RPR will be required for the completion of said contract in an acceptable manner.

All costs and charges incurred by the Owner, together with the cost of completing the work under contract, will be deducted from any monies due or which may become due the Contractor. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the surety shall be liable and shall pay to the Owner the amount of such excess.

80-10 Termination for national emergencies. The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the execution of war or in the interest of national defense.

When the contract, or any portion thereof, is terminated before completion of all items of work in the contract, payment will be made for the actual number of units or items of work completed at the contract price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits shall be considered.

Reimbursement for organization of the work, and other overhead expenses, (when not otherwise included in the contract) and moving equipment and materials to and from the job will be considered, the intent being that an equitable settlement will be made with the Contractor.

Acceptable materials, obtained or ordered by the Contractor for the work and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor at actual cost as shown by receipted bills and actual cost records at such points of delivery as may be designated by the RPR.

Termination of the contract or a portion thereof shall neither relieve the Contractor of their responsibilities for the completed work nor shall it relieve their surety of its obligation for and concerning any just claim arising out of the work performed.

80-11 Work area, storage area and sequence of operations. The Contractor shall obtain approval from the RPR prior to beginning any work in all areas of the airport. No operating runway, taxiway, or air operations area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate work in accordance with the approved CSPP and SPCD.

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Section 90 Measurement and Payment

90-01 Measurement of quantities. All work completed under the contract will be measured by the RPR, or their authorized representatives, using United States Customary Units of Measurement.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet (0.8 square meters) or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the RPR.

Unless otherwise specified, all contract items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.

The term "lump sum" when used as an item of payment will mean complete payment for the work described in the contract. When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

When requested by the Contractor and approved by the RPR in writing, material specified to be measured by the cubic yard (cubic meter) may be weighed, and such weights will be converted to cubic yards (cubic meters) for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the RPR and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

Measurement and Payment Terms

Term	Description
Excavation and Embankment Volume	In computing volumes of excavation, the average end area method will be used unless otherwise specified.
Measurement and Proportion by Weight	The term "ton" will mean the short ton consisting of 2,000 pounds (907 km) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.

Term	Description
Asphalt Material	Asphalt materials will be measured by the gallon (liter) or ton (kg). When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.
Cement	Cement will be measured by the ton (kg) or hundredweight (km).
Structure	Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
Timber	Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.
Plates and Sheets	The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.
Miscellaneous Items	When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.
Scales	Scales must be tested for accuracy and serviced before use. Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the RPR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound (454 grams). The use of spring balances will not be permitted. In the event inspection reveals the scales have been “overweighing” (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%.

Term	Description
	In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded. Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them. Scale installations shall have available ten standard 50-pound (2.3 km) weights for testing the weighing equipment or suitable weights and devices for other approved equipment. All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.
Rental Equipment	Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the work. Special equipment ordered in connection with extra work will be measured as agreed in the change order or supplemental agreement authorizing such work as provided in paragraph 90-05 *Payment for Extra Work*.
Pay Quantities	When the estimated quantities for a specific portion of the work are designated as the pay quantities in the contract, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the RPR. If revised dimensions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

90-02 Scope of payment. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials, for performing all work under the contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the execution thereof, subject to the provisions of Section 70, paragraph 70-18, *No Waiver of Legal Rights*.

When the "basis of payment" subsection of a technical specification requires that the contract price (price bid) include compensation for certain work or material essential to the item, this same work or material will not also be measured for payment under any other contract item which may appear elsewhere in the contract, plans, or specifications.

90-03 Compensation for altered quantities. When the accepted quantities of work vary from the quantities in the proposal, the Contractor shall accept as payment in full, so far as contract items are concerned, payment at the original contract price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in Section 40, paragraph 40-02, *Alteration of Work and Quantities,* will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor which results directly from such alterations or indirectly from their own unbalanced allocation of overhead and profit among the contract items, or from any other cause.

90-04 Payment for omitted items. As specified in Section 40, paragraph 40-03, *Omitted Items,* the RPR shall have the right to omit from the work (order nonperformance) any contract item, except major contract items, in the best interest of the Owner.

Should the RPR omit or order nonperformance of a contract item or portion of such item from the work, the Contractor shall accept payment in full at the contract prices for any work actually completed and acceptable prior to the RPR's order to omit or non-perform such contract item.

Acceptable materials ordered by the Contractor or delivered on the work prior to the date of the RPR's order will be paid for at the actual cost to the Contractor and shall thereupon become the property of the Owner.

In addition to the reimbursement hereinbefore provided, the Contractor shall be reimbursed for all actual costs incurred for the purpose of performing the omitted contract item prior to the date of the RPR's order. Such additional costs incurred by the Contractor must be directly related to the deleted contract item and shall be supported by certified statements by the Contractor as to the nature the amount of such costs.

90-05 Payment for extra work. Extra work, performed in accordance with Section 40, paragraph 40-04, *Extra Work*, will be paid for at the contract prices or agreed prices specified in the change order or supplemental agreement authorizing the extra work.

90-06 Partial payments. Partial payments will be made to the Contractor at least once each month as the work progresses. Said payments will be based upon estimates, prepared by the RPR, of the value of the work performed and materials complete and in place, in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with paragraph 90-07, *Payment for Materials on Hand*. No partial payment will be made when the amount due to the Contractor since the last estimate amounts to less than five hundred dollars.

a. From the total of the amount determined to be payable on a partial payment, 10% percent of such total amount will be deducted and retained by the Owner for protection of the Owner's interests. Unless otherwise instructed by the Owner, the amount retained by the Owner will be in effect until the final payment is made except as follows:

(1) Contractor may request release of retainage on work that has been partially accepted by the Owner in accordance with Section 50-14. Contractor must provide a certified invoice to the RPR that supports the value of retainage held by the Owner for partially accepted work.

(2) In lieu of retainage, the Contractor may exercise at its option the establishment of an escrow account per paragraph 90-08.

b. The Contractor is required to pay all subcontractors for satisfactory performance of their contracts no later than 30 days after the Contractor has received a partial payment. Contractor must provide the Owner evidence of prompt and full payment of retainage held by the prime Contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed. A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the Owner. When the Owner has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

c. When at least 95% of the work has been completed to the satisfaction of the RPR, the RPR shall, at the Owner's discretion and with the consent of the surety, prepare estimates of both the contract value and the cost of the remaining work to be done. The Owner may retain an amount not less than twice the contract

value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the Contractor

It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the RPR to be a part of the final quantity for the item of work in question.

No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in paragraph 90-09, *Acceptance and Final Payment*.

The Contractor shall deliver to the Owner a complete release of all claims for labor and material arising out of this contract before the final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.

90-07 Payment for materials on hand. Partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the requirements of the contract, plans, and specifications and are delivered to acceptable sites on the airport property or at other sites in the vicinity that are acceptable to the Owner. Such delivered costs of stored or stockpiled materials may be included in the next partial payment after the following conditions are met:

a. The material has been stored or stockpiled in a manner acceptable to the RPR at or on an approved site.

b. The Contractor has furnished the RPR with acceptable evidence of the quantity and quality of such stored or stockpiled materials.

c. The Contractor has furnished the RPR with satisfactory evidence that the material and transportation costs have been paid.

d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.

e. The Contractor has furnished the Owner evidence that the material stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.

It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of their responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans, and specifications.

In no case will the amount of partial payments for materials on hand exceed the contract price for such materials or the contract price for the contract item in which the material is intended to be used.

No partial payment will be made for stored or stockpiled living or perishable plant materials.

The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this paragraph.

90-08 Payment of withheld funds. At the Contractor's option, if an Owner withholds retainage in accordance with the methods described in paragraph 90-06 *Partial Payments*, the Contractor may request that the Owner deposit the retainage into an escrow account. The Owner's deposit of retainage into an escrow account is subject to the following conditions:

a. The Contractor shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the Owner.

b. The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the Owner and having a value not less than the retainage that would otherwise be withheld from partial payment.

c. The Contractor shall enter into an escrow agreement satisfactory to the Owner.

d. The Contractor shall obtain the written consent of the surety to such agreement.

90-09 Acceptance and final payment. When the contract work has been accepted in accordance with the requirements of Section 50, paragraph 50-15, *Final Acceptance*, the RPR will prepare the final estimate of the items of work actually performed. The Contractor shall approve the RPR's final estimate or advise the RPR of the Contractor's objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the RPR shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor's receipt of the RPR's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may approve the RPR's estimate under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a claim in accordance with Section 50, paragraph 50-16, *Claims for Adjustment and Disputes*.

After the Contractor has approved, or approved under protest, the RPR's final estimate, and after the RPR's receipt of the project closeout documentation required in paragraph 90-11, *Contractor Final Project Documentation*, final payment will be processed based on the entire sum, or the undisputed sum in case of approval under protest, determined to be due the Contractor less all previous payments and all amounts to be deducted under the provisions of the contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor has filed a claim for additional compensation under the provisions of Section 50, paragraph 50-16, *Claims for Adjustments and Disputes,* or under the provisions of this paragraph, such claims will be considered by the Owner in accordance with local laws or ordinances. Upon final adjudication of such claims, any additional payment determined to be due the Contractor will be paid pursuant to a supplemental final estimate.

90-10 Construction warranty.

a. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of one year from the date of final acceptance of the work, except as noted. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession.

c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Owner real or personal property, when that damage is the result of the Contractor's failure to conform to contract requirements; or any defect of equipment, material, workmanship, or design furnished by the Contractor.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

e. The Owner will notify the Contractor, in writing, within seven (7) days after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within 14 days after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.

h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

90-11 Contractor Final Project Documentation. Approval of final payment to the Contractor is contingent upon completion and submittal of the items listed below. The final payment will not be approved until the RPR approves the Contractor's final submittal. The Contractor shall:

a. Provide two (2) copies of all manufacturers warranties specified for materials, equipment, and installations.

b. Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.

c. Complete final cleanup in accordance with Section 40, paragraph 40-08, *Final Cleanup*.

d. Complete all punch list items identified during the Final Inspection.

e. Provide complete release of all claims for labor and material arising out of the Contract.

f. Provide a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project.

g. When applicable per state requirements, return copies of sales tax completion forms.

h. Manufacturer's certifications for all items incorporated in the work.

i. All required record drawings, as-built drawings or as-constructed drawings.

j. Project Operation and Maintenance (O&M) Manual(s).

k. Security for Construction Warranty.

l. Equipment commissioning documentation submitted, if required.

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DIVISION VI - PART 2

Part 2 - FAA General Construction Items

Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

a. Provide qualified personnel to develop and implement the CQCP.

b. Provide for the production of acceptable quality materials.

c. Provide sufficient information to assure that the specification requirements can be met.

d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.

b. Discussion of the QA program.

c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.

d. Establish regular meetings to discuss control of materials, methods and testing.

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 10 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time on-site employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.

(4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.

(2) Performance of all QC tests as required by the technical specifications and paragraph100-8.

(3) Performance of tests for the RPR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

8.1.3 Equipment Calibration and Checks;

8.1.9 Equipment Calibration, Standardization, and Check Records;

8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

7 Test Methods and Procedures

8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

a. Specification item number (e.g., P-401)

b. Item description (e.g., Hot Mix Asphalt Pavements)

c. Test type (e.g., gradation, grade, asphalt content)

d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)

e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)

f. Responsibility (e.g., plant technician)

g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description
(2) Compliance with approved submittals
(3) Proper storage of materials and equipment
(4) Proper operation of all equipment
(5) Adherence to plans and technical specifications
(6) Summary of any necessary corrective actions
(7) Safety inspection.
(8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description
(2) Test designation
(3) Location
(4) Date of test
(5) Control requirements
(6) Test results

(7) Causes for rejection

(8) Recommended remedial actions

(9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.

b. When 25% or more of the original contract is earned, an additional 25%.

c. When 50% or more of the original contract is earned, an additional 20%.

d. When 75% or more of the original contract is earned, an additional 20%

e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100 Contractor Quality Control Program (CQCP)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100

Item C-102 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

Refer to Item C-102A Water Pollution Control, Erosion Control, and SWPPP for additional information to meet state and local requirements.

MATERIALS

102-2.1 Grass. Not Used.

102-2.2 Mulches. Not Used.

102-2.3 Fertilizer. Not Used.

102-2.4 Slope drains. Not Used.

102-2.5 Silt fence. Refer to item C-102A Local Erosion Control Requirements.

102-2.6 Inlet protection. Refer to item C-102A Local Erosion Control Requirements.

102-2.7 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

102-3.4 Installation, maintenance, and removal of silt fence. Refer to item C-102A Local Erosion Control Requirements.

METHOD OF MEASUREMENT

102-4.1 Refer to Item C-102A Local Erosion Control Requirements for measurement and payment.

BASIS OF PAYMENT

102-5.1 Refer to Item C-102A Local Erosion Control Requirements for measurement and payment.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circulars (AC)

AC 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

AC 150/5370-2 *Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA / USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

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Item C-102A Local Erosion Control Requirements

DESCRIPTION

102A-1.1 Erosion Control shall conform to California Regional Water Quality Control Board for the Central Coast Region, County of San Luis Obispo Stormwater Requirements, County of San Luis Obispo Best Management Practices (BMPs) and these special provisions. Work shall consist of applying Erosion Control materials to the areas shown on the Plans, embankment and excavation slopes and other areas disturbed by construction activities and as directed by the Engineer.

102A-1.2 County of San Luis Obispo Post-Construction Stormwater Requirements. Prior to the start of construction activity, the Contractor shall review the County's Post-Construction Stormwater Requirements found at:
https://www.slocounty.ca.gov/Departments/Planning-Building/Forms-Documents/Stormwater-Forms-and-Documents/Post-Construction-Stormwater-Management/Stormwater-Post-Construction-Documents/Post-Construction-Stormwater-Requirements.pdf.

Additional information for the Central Coast Region can be found at:
https://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.html.

102A-1.3 Water Pollution Control (for projects with over 1 acre of disturbed area). Prior to any construction activity, the Contractor shall prepare, submit, and obtain approval of a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the NPDES General Construction Permit for stormwater and non-stormwater discharges associated with construction activities, entitled: "National Pollutant Discharge Elimination System (NPDES) Permit – Water Quality Order 2009-0009-DWQ. " Approval of the SWPPP shall not relieve the Contractor of any liability for violations of State or Federal law relating to water pollution.

Approval of the NPDES permit that regulates this project, as referenced above, is hereafter collectively referred to as the "Permit."

This project shall conform to the Permit and modifications thereto. The Contractor shall maintain copies of the Permit at the project site and shall make the Permit available during construction.

The Contractor shall know and fully comply with applicable provisions of the Permit and all modifications thereto, and Federal, State, and local regulations and requirements that govern the Contractor's operations and stormwater and non-stormwater discharges from both the project site and areas of disturbance outside the project limits during construction.

The Permit shall apply to stormwater and certain permitted non-stormwater discharges from areas outside the project site which are directly related to construction activities for this contract including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards, and access roads. The Contractor shall comply with the Permit for those areas and shall implement, inspect, and maintain the required water pollution control practices. Installing, inspecting, and maintaining water pollution control practices on areas outside the right-of-way not specifically arranged and provided for by San Luis Obispo County for the execution of this contract, will not be paid for.

The Contractor shall be responsible for penalties assessed or levied on the Contractor or San Luis Obispo County as a result of the Contractor's failure to comply with the provisions in this section "Water

Pollution Control" including, but not limited to, compliance with the applicable provisions of the Permit, and Federal, State, and local regulations and requirements as set forth therein.

Penalties as used in this section, "Water Pollution Control," shall include fines, penalties and damages, whether proposed, assessed, or levied against San Luis Obispo County or the Contractor, including those levied under the Federal Clean Water Act, State Fish and Wildlife Code, and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred due to stop work orders, work suspension, scheduled days, and/or Contractor delays or in settlement for alleged violations of the Permit, or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, due to agency or County imposed mitigation or to remediate or correct violations, or damages resulting from stop work orders, work suspension, or scheduled days.

102A-1.4 Stormwater Pollution Prevention Plan Preparation, Approval, and Amendments. As part of the water pollution control work, a SWPPP is required for this contract. The SWPPP shall conform to the provisions in this section, "Water Pollution Control," the requirements of the Permit, and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be considered to fulfill the provisions of the contract bid item “Prepare Stormwater Pollution Prevention Plan”.

Approval shall not constitute a finding that the SWPPP complies with applicable requirements of the Permit, the Manuals and applicable Federal, State, and local laws, regulations, permits, and requirements, nor does approval supersede the requirements and provisions of these special provisions, the Permit, or any other Federal, State, or local regulations or permit in the event of a conflict.

The SWPPP shall address stormwater run-off and run-on for all disturbed and affected areas of construction, including temporary and permanent measures. The SWPPP submittal shall contain the complete SWPPP document, along with the following information identified separately:

a. Latitude / longitude of project site

b. Total project site size (acres)

c. Total area to be disturbed (acres)

d. Percent imperviousness before construction

e. Percent imperviousness after construction

f. Date construction will begin

g. Date all grading will be complete

h. Date project will be complete

i. Risk Assessment including the R Factor Value, K Factor Value, LS Factor, site sediment risk factor, and Receiving Water Risk Factor.

j. Name of receiving water and whether project site run-off drains directly, indirectly, or through the storm drain system.

k. Name of QSD, QSD Certification Number, and QSD SMARTS user ID

l. Name of QSP QSP Certification Number, and QSP SMARTS user ID

m. Contractor’s site contact person, and their title, phone, and email address

n. Contractor’s designated Data Submitter and their SMARTS user ID

The SWPPP submittal shall be provided to the Engineer for review and approval. Upon approval, the County shall prepare a Notice of Intent (NOI) and submit the SWPPP electronically to the State Water Resources Control Board (State) website, entitled Stormwater Multi Application Reporting and Tracking System (SMARTS). For the purposes of the Permit, San Luis Obispo County is the owner of the Permit, and the County Engineer is the Legally Responsible Person (LRP). The LRP will retain authority for assigning the Approved Signatories and Data Submitters in SMARTS. The Contractor's QSP and/or QSD will be designated as Data Submitters in SMARTS, including the responsibilities thereof, as required by the Permit. The County will submit the appropriate fee to the State and obtain a certified NOI and Waste Discharge Identification Number (WDID) for the project.

The Contractor shall submit the WPCP to the Engineer within 7 calendar days of the Notice to Proceed date. The Contractor shall submit three (3) copies of the draft SWPPP to the Engineer. The Engineer will have five (5) working days to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within five (5) working days of receipt of the Engineer's comments. The Engineer will have five (5) working days to review the revisions. Upon the Engineer's approval of the SWPPP, four (4) approved hard copies and one (1) electronic copy of the SWPPP shall be submitted to the Engineer. The electronic copy shall contain files no more than 50 megabytes in size. Within 3 working days of receipt of the electronic copy, the County will upload the SWPPP to the State SMARTS website. No ground disturbing work shall occur until the NOI is complete and the SWPPP has been uploaded to the State website, and a WDID number is obtained. The Engineer will notify the Contractor in writing when the process is complete which will allow ground disturbing work to begin. In the event the Engineer fails to complete the reviews or upload the SWPPP within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review and/or upload, an extension of time will be granted, in the same manner as provided for in the Standard Specifications.

The SWPPP shall apply to the areas within or immediately outside of the right-of-way that are directly related to all construction activities including, but not limited to, material borrow or disposal areas, staging areas, storage yards, and access roads, including those on-site areas developed by the Contractor with third parties for use during the project.

The SWPPP shall incorporate water pollution control practices in the following categories:

a. Soil stabilization.

b. Sediment control.

c. Wind erosion control.

d. Tracking control.

e. Non-stormwater management.

f. Waste management and materials pollution control.

The Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The Water Pollution Control Schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices.

Water pollution control practices include the "Minimum Requirements" and other Contractor-selected water pollution control practices from the "SWPPP", and the "Project-Specific Minimum Requirements" identified in the Water Pollution Control Cost Break-Down of this section.

The Contractor shall incorporate water pollution control practices into the SWPPP as defined in the California Stormwater Quality Association (CASQA) or California Department of Transportation (Caltrans) handbooks. Water pollution control practices shall include Contractor-selected water pollution control practices and "Project-Specific Minimum Requirements" identified in the Water Pollution Control Cost Break-Down of this section.

The requirements described herein are considered minimum requirements to satisfy San Luis Obispo County erosion control standards. Additional BMPs may be required to meet the requirements set forth in the SWPPP and the Permit. All BMPs shall be designed, installed, maintained, and otherwise managed pursuant to the provisions set forth in the Caltrans Stormwater Quality Handbook, Construction Site BMP Manual, current edition, or the CASQA California Stormwater BMP Handbook for Construction, current edition. The Contractor and/or his preparer may recommend equivalent erosion control applications that provide equal or better performance for consideration and approval by the Engineer. Approval of the SWPPP by the County shall not relieve the Contractor of any liability for violations of State or Federal water pollution control laws, Clean Water Act, Porter-Cologne Water Quality Control Act, Federal Endangered Species Act, State Fish and Wildlife Code, and other applicable laws and regulations.

The Contractor shall prepare an amendment to the SWPPP as required by the Permit, such as when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, storm drain systems; when the Contractor's activities or operations violate a condition of the Permit; when there is a change in the schedule that affects the discharge of pollutants; when there is a change in the schedule that affects the Risk Level required by the Permit; or when directed by the Engineer. Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved SWPPP. Amendments to the SWPPP shall be prepared and submitted for review and approval within the time required by the Permit and approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the SWPPP. Approved amendments shall be submitted electronically to the Engineer within 24 hours of approval. At a minimum, the SWPPP shall be amended annually as required by the Permit, and an electronic copy submitted to the Engineer.

The Contractor shall keep one copy of the approved SWPPP and approved amendments at the project site. The SWPPP shall be made available upon request by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or the County. Requests by the public shall be directed to the Engineer.

102A-1.5 Cost Break-down. The Contractor shall include a Water Pollution Control Cost Break-Down in the SWPPP which itemizes the contract lump sum for water pollution control work. The Contractor shall use the Water Pollution Control Cost Break-down provided in this section as the basis for the cost break-down submitted with the SWPPP. The Contractor shall use the Water Pollution Control Cost Break-down to identify items, quantities, and non-adjustable values for water pollution control work, excluding water pollution control practices for which there are separate bid items. The Contractor shall be responsible for the accuracy of the quantities and non-adjustable values used in the cost break-down submitted with the SWPPP. Partial payment for the item of Prepare SWPPP will not be made until the Water Pollution Control Cost Break-Down is approved by the Engineer.

Line items indicated in the Water Pollution Control Cost Break-down in this section with a specified Estimated Quantity shall be considered "Project-Specific Minimum Requirements." The Contractor shall incorporate Project-Specific Minimum Requirements with Contractor-designated quantities and values into the Water Pollution Control Cost Break-down submitted with the SWPPP.

Line items indicated in the Water Pollution Control Cost Break-down in this section without a specified Estimated Quantity shall be considered by the Contractor for selection to meet the applicable requirements for water pollution control work required in the SWPPP. Line items with estimated quantities can be increased, if desired, by the Contractor. In the Water Pollution Control Cost Break-Down submitted with the SWPPP, the Contractor shall list only those water pollution control practices selected for the project, including quantities and non-adjustable values required to complete the work for those items.

The sum of the amounts for the items of work listed in the Water Pollution Control Cost Break-down shall be equal to the contract lump sum price bid for "Implement Stormwater Pollution Prevention Plan". Water pollution control practices listed as separate bid items shall not be included in the contract lump sum amount. Overhead and profit shall be included in the individual items listed in the cost break-down.

WATER POLLUTION CONTROL COST BREAK-DOWN

ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	VALUE	AMOUNT
Erosion Control (Temporary)	ACRE	0.17		
Erosion Control (Permanent)	ACRE	0		
Mulch	ACRE	0		
Geotextiles, Plastic Covers & Erosion Control Blankets/Mats	SQYD	0		
Wood Mulching	SQYD	0		
Earth Dikes/Drainage Swales & Lined Ditches	LF	0		
Outlet Protection/Velocity Dissipation Devices	EA	0		
Slope Drains	EA	0		
Silt Fence	LF	0		
Desilting Basin	EA	0		
Sediment Trap	EA	0		
Gravel Check Dam	TON	0		
Fiber Rolls	LF	170		
Gravel Bag Berm	LF	0		
Street Sweeping and Vacuuming	LS	1		
Sandbag Barrier	LF	0		
Straw Bale Barrier	LF	0		
Storm Drain Inlet Protection	EA	5		
Wind Erosion Control	LS	1		
Stabilized Construction Entrance/Exit	EA	1		
Stabilized Construction Roadway	EA	0		
Entrance/Outlet Tire Wash	EA	0		
Water Conservation Practices	LS	0		
Dewatering Operations	EA	0		
Paving and Grinding Operations	LS	0		
Temporary Stream Crossing	EA	0		
Clear Water Diversion	EA	0		
Illicit Connection/Illegal Discharge Detection and Reporting	LS	0		
Potable Water/Irrigation	LS	0		

Vehicle and Equipment Cleaning	LS	0
Vehicle and Equipment Fueling	LS	0
Vehicle and Equipment Maintenance	LS	0
Material Delivery and Storage	LS	0
Material Use	LS	0
Stockpile Management	LS	1
Spill Prevention and Control	LS	1
Solid Waste Management	LS	1
Hazardous Waste Management	LS	0
Contaminated Soil Management	LS	0
Concrete Waste Management	LS	1
Sanitary/Septic Waste Management	LS	1
Liquid Waste Management	LS	1

TOTAL _____

No adjustment in compensation will be made to the contract lump sum price paid for water pollution control due to differences between the quantities shown in the approved cost break-down and the quantities required to complete the work as shown on the approved SWPPP. No adjustment in compensation will be made for ordered changes to correct SWPPP work resulting from the Contractor's own operations or from the Contractor's negligence.

The approved cost break-down will be used as the basis for calculating the adjustment in compensation for the item of "Implement Stormwater Pollution Prevention Plan" due to increases or decreases of quantities ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down item, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 40-02, "Alteration of work and quantities," of the General Contract Provisions. If an ordered change requires a new item which is not on the approved cost break-down, the adjustment in compensation will be determined in the same manner specified for extra work in conformance with Section 40-04, "Extra Work," of the General Contract Provisions.

102A-1.6 SWPPP Implementation. If there is a discrepancy between the project Permit and these special provisions, the Permit language shall supersede. If there is a discrepancy between the SWPPP and these special provisions, the special provisions shall supersede. Unless otherwise specified, upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, replacing, removing, and disposing of temporary water pollution control practices; installing, constructing, inspecting, maintaining, and replacing permanent water pollution control practices specified in the SWPPP and in the amendments; and all reporting and monitoring. The duration of work includes that time period between initial mobilization to the site and acceptance of the work. Unless otherwise directed by the Engineer, the Contractor's responsibility for SWPPP implementation shall continue throughout temporary suspensions of work. Requirements for installation, construction, inspection, reporting, monitoring, maintenance, replacement, removal, and

disposal of water pollution control practices shall conform to the requirements in these special provisions and to project permits.

Installing, inspecting, and maintaining water-pollution control practices on areas outside the right-of-way (or designated work area) not specifically arranged and provided for by San Luis Obispo County for the execution of this contract, will not be paid for.

If the Contractor or the Engineer identifies a deficiency in the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately unless requested by the Contractor and approved by the Engineer in writing but shall be corrected prior to the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section, "Water Pollution Control."

If the Contractor fails to conform to the provisions of this section, the Engineer may order the suspension of construction operations and/or may hire a third party to correct the deficiency. All costs associated with such work will be deducted from the Contractor's retention.

Implementation of water pollution control practices may vary by season. These special provisions shall be followed for control practice selection of year-round, rainy season and non-rainy season water pollution control practices.

102A-1.7 Year-Round Implementation Requirements. The Contractor shall have a year-round program for implementing, inspecting and maintaining water pollution control practices for wind erosion control, tracking control, non-stormwater management, and waste management and materials pollution control.
The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. These Specifications require that if 30 percent or greater precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation. If there is less than a 30 percent chance of precipitation, the Contractor shall still be responsible for ensuring the project site does not result in a discharge of pollutants off-site. Regardless of the chances of precipitation, the Contractor shall allow adequate time to properly install all required BMPs prior to precipitation.

Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur, or will occur during the ensuing 14 days. Non-active areas shall be stabilized with water pollution control practice within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

102A-1.8 Maintenance. To ensure the proper implementation and functioning of water pollution control practices, the Contractor shall regularly inspect and maintain the construction site for the water pollution control practices identified in the SWPPP and as required by the Permit. The construction site shall be inspected by the Contractor as follows:

A. Prior to a forecast storm.

B. After a precipitation event which causes site runoff.

C. At 24-hour intervals during extended precipitation events.

D. Routinely, a minimum of once every week

E. Quarterly throughout the year

The Contractor shall use a Stormwater Quality Construction Site Inspection Checklist approved by the Engineer. One copy of each site inspection record shall be submitted to the Engineer within 48 hours of completing the inspection.

102A-1.9 Reporting and Monitoring Requirements. All reporting and monitoring efforts required by the Permit are the responsibility of the Contractor. Such activities include but are not limited to preparation and implementation of the Rain Event Action Plans (REAP), Annual Reports, water sampling, and storm event monitoring and reporting. Reports shall be uploaded to SMARTS as required by the Permit. Annual Reports shall be completed in SMARTS and the Engineer notified when complete. The County will review and certify the Annual Report. The County will complete the Notice of Termination (NOT) upon completion of the project and after the project site is stabilized and protected from erosion. All Annual Reports must be completed and approved by the State prior to approval of the NOT.

If the Contractor identifies discharges from the project site, regardless of source, in a manner causing, or potentially causing, a condition of pollution in surface waters or drainage systems, the Contractor shall immediately inform the Engineer. In addition, the Contractor shall submit a written Notice of Discharge report to the Engineer within 24 hours of the discharge event. The report shall include the following information:

A. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.

B. The water pollution control practices deployed before the discharge event.

C. The date of deployment and type of water pollution control practices deployed after the discharge event, including additional measures installed or planned to remediate and clean-up the discharge, and/or reduce or prevent reoccurrence.

D. An implementation and maintenance schedule for affected water pollution control practices.

102A-1.9 Report of First-Time Non-Stormwater Discharge. The Contractor shall notify the Engineer at least 3 days in advance of first-time non-stormwater discharge events, excluding exempted discharges. The Contractor shall notify the Engineer of the operations causing non-stormwater discharges and shall obtain field approval for first-time non-stormwater discharges. Non-stormwater discharges shall be monitored at first-time occurrences and routinely thereafter.

If the Contractor receives a written Notice, Order, or other non-compliance action letter from a regulatory agency as a result of stormwater or other discharges from the project site, the Contractor shall immediately notify the Engineer. The Contractor shall be solely responsible for responding to and complying with the Notice, Order, or action letter, unless otherwise directed by the Engineer.

Unless otherwise directed in this Section, and in addition to the requirements of the Permit, the Contractor shall submit for approval, all required inspection reports, monitoring reports, action plans, notices, amendments, and other documentation required to satisfy requirements of the Permit, to the Engineer within 3 days of their completion. The Engineer will have 3 days to approve the documents as complete and sufficient to satisfy the Permit or other agency requirements. If the documents are not complete and sufficient, the Engineer will return them to the Contractor for resubmittal. The Contractor shall be responsible for submitting complete, accurate, and detailed reporting documents sufficient to satisfy all conditions of the Permit and regulatory agency requirements.

BASIS OF PAYMENT

102A-2.1 The contract lump sum price paid for “Prepare Stormwater Pollution Prevention Plan” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising and amending the SWPPP as specified herein, and as directed by the Engineer.

No additional payment will be made to correct deficiencies in the approved SWPPP or Amendments.

102A-2.2 The contract lump sum price paid for “Implement Stormwater Pollution Prevention Plan” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in implementing the SWPPP, installing, constructing, removing, and disposing of water pollution control practices, including non-stormwater management, and waste management and materials for water pollution control practices as provided for in the approved SWPPP, except those for which there is a contract item of work as specified in the Standard Specifications and these special provisions, and as directed by the RPR.

Full compensation for Permit reporting and compliance, including all monitoring, preparation of inspection reports, and stormwater sampling and analysis, and maintenance costs of Water Pollution Control Practices, Amendments, and Implementation of Amendments as specified in this section, "Water Pollution Control", shall be considered as included in the contract lump sum price paid for "Implement Stormwater Pollution Prevention Plan" and no additional compensation will be allowed therefor.

No additional payment will be made for Water Pollution Control Practices necessary to correct deficiencies in the approved SWPPP or Amendments.

Water pollution control practices for which there is a contract item of work, will be measured and paid for as that contract item of work.

Payments for "Implement Stormwater Pollution Prevention Plan" will be made as follows:

A. Monthly progress payments for “Implement Stormwater Pollution Prevention Plan" will be paid based on the monthly project completion percentage.

B. The proposed final estimate payment will include the final balance of payment for this item of work.

Payment will be made under:

Item C-102A-2.1	Prepare Stormwater Pollution Prevention Plan – per lump sum
Item C-102A-2.2	Implement Stormwater Pollution Prevention Plan – per lump sum

END OF ITEM C-102A

Item C-105 Mobilization

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 10 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. An Engineer/RPR field office is not required.

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

a. With first pay request, 25%.

b. When 25% or more of the original contract is earned, an additional 25%.

c. When 50% or more of the original contract is earned, an additional 40%.

d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by Section 90, paragraph 90-11, Contractor Final Project Documentation, the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105	Mobilization

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

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DIVISION IV - PARTS 3 – 13

(as applicable)

FAA Technical Specifications

Item D-701 Pipe for Storm Drains and Culverts

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

701-2.1 Materials shall meet the requirements shown on the plans and specified below. Underground piping and components used in drainage systems for terminal and aircraft fueling ramp drainage shall be noncombustible and inert to fuel in accordance with National Fire Protection Association (NFPA) 415.

701-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements:

AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM D3034	Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

701-2.3 Concrete. Concrete for pipe cradles shall have a minimum compressive strength of 2000 psi at 28 days and conform to the requirements of ASTM C94.

701-2.4 Rubber gaskets. Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443. Rubber gaskets for PVC pipe, polyethylene, and polypropylene pipe shall conform to the requirements of ASTM F477. Rubber gaskets for zinc-coated steel pipe and precoated galvanized pipe shall conform to the requirements of ASTM D1056, for the "RE" closed cell grades. Rubber gaskets for steel reinforced thermoplastic ribbed pipe shall conform to the requirements of ASTM F477.

701-2.5 Joint mortar. Pipe joint mortar shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

701-2.6 Joint fillers. Poured filler for joints shall conform to the requirements of ASTM D6690**.**

701-2.7 Plastic gaskets. Plastic gaskets shall conform to the requirements of ASTM C990**.**

701-2.8. Controlled low-strength material (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153. When CLSM is used, all joints shall have gaskets**.**

701-2.9 Precast box culverts. Manufactured in accordance with and conforming to ASTM C1433.

701-2.10 Precast concrete pipe. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or American Concrete Pipe Association QCast Plant Certification program.

CONSTRUCTION METHODS

701-3.1 Excavation. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall not be less than the external diameter of the pipe plus 12 inches on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch or 1/2 inch for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade should be filled with granular material to form a uniform foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The RPR shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

The excavation for pipes placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

701-3.2 Bedding. The bedding surface for the pipe shall provide a foundation of uniform density to support the pipe throughout its entire length.

a. Rigid pipe. The pipe bedding shall be constructed uniformly for the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 in when the bedding thickness is less than 6 inches, and 1-1/2 in when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed uncompacted material under the middle third of the pipe prior to placement of the pipe.

b. Flexible pipe. For flexible pipe, the bed shall be roughly shaped to fit the pipe, and a bedding blanket of sand or fine granular material shall be provided as follows:

Flexible Pipe Bedding

Pipe Corrugation Depth		Minimum Bedding Depth	
inch	**mm**	**inch**	**mm**
1/2	12	1	25
1	25	2	50
2	50	3	75
2-1/2	60	3-1/2	90

c. Other pipe materials. For PVC, polyethylene, polypropylene, or fiberglass pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4 inches. For pipes installed under paved areas, no more than 12% of the material shall pass the No. 200 sieve. For all other

areas, no more than 50% of the material shall pass the No. 200 sieve. The bedding shall have a thickness of at least 6 inches below the bottom of the pipe and extend up around the pipe for a depth of not less than 50% of the pipe's vertical outside diameter.

701-3.3 Laying pipe. The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes and outside circumferential laps of flexible pipes shall be placed facing upgrade.

Paved or partially lined pipe shall be placed so that the longitudinal center line of the paved segment coincides with the flow line.

Elliptical and elliptically reinforced concrete pipes shall be placed with the manufacturer's reference lines designating the top of the pipe within five degrees of a vertical plane through the longitudinal axis of the pipe.

701-3.4 Joining pipe. Joints shall be made with PVC pipe.

Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the pipe and shall be finished smooth on the inside. Molds or runners shall be used for grouted joints to retain the poured grout. Rubber ring gaskets shall be installed to form a flexible watertight seal.

a. Concrete pipe. Concrete pipe may be either bell and spigot or tongue and groove. Pipe sections at joints shall be fully seated and the inner surfaces flush and even. Concrete pipe joints shall be sealed with rubber gaskets meeting ASTM C443 when leak resistant joints are required**.**

b. Metal pipe. Metal pipe shall be firmly joined by form-fitting bands conforming to the requirements of ASTM A760 for steel pipe and AASHTO M196 for aluminum pipe.

c. PVC, Polyethylene, or Polypropylene pipe. Joints for PVC, Polyethylene, or Polypropylene pipe shall conform to the requirements of ASTM D3212 when leak resistant joints are required. Joints for PVC and Polyethylene pipe shall conform to the requirements of AASHTO M304 when soil tight joints are required. Fittings for polyethylene pipe shall conform to the requirements of AASHTO M252 or ASTM M294. Fittings for polypropylene pipe shall conform to ASTM F2881, ASTM F2736, or ASTM F2764.

701-3.5 Embedment and Overfill. Pipes shall be inspected before any fill material is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense.

701-3.5-1 Embedment Material Requirements

a. Concrete Pipe. Embedment material and compaction requirements shall be in accordance with the applicable Type of Standard Installation (Types 1, 2, 3, or 4) per ASTM C1479. If a concrete cradle or CLSM embedment material is used, it shall conform to the plan details.

b. Plastic and fiberglass Pipe. Embedment material shall meet the requirements of ASTM D3282, A-1, A-2-4, A-2-5, or A-3. Embedment material shall be free of organic material, stones larger than 1.5 inches in the greatest dimension, or frozen lumps. Embedment material shall extend to 12 inches above the top of the pipe.

c. Metal Pipe. Embedment material shall be granular as specified in the contract document and specifications, and shall be free of organic material, rock fragments larger than 1.5 inches in the greatest dimension and frozen lumps. As a minimum, backfill materials shall meet the requirements of ASTM D3282, A-1, A-2, or A-3. Embedment material shall extend to 12 inches above the top of the pipe.

701-3.5-2 Placement of Embedment Material

The embedment material shall be compacted in layers not exceeding 6 inches on each side of the pipe and shall be brought up one foot above the top of the pipe or to natural ground level, whichever is greater.

Thoroughly compact the embedment material under the haunches of the pipe without displacing the pipe. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the embedment material shall be compacted in layers not exceeding 6 inches and shall be brought up evenly on each side of the pipe to one foot above the top of the pipe. All embedment material shall be compacted to a density required under Item P-152.

Concrete cradles and flowable fills, such as controlled low strength material (CLSM) or controlled density fill (CDF), may be used for embedment provided adequate flotation resistance can be achieved by restraints, weighing, or placement technique.

It shall be the Contractor's responsibility to protect installed pipes and culverts from damage due to construction equipment operations. The Contractor shall be responsible for installation of any extra strutting or backfill required to protect pipes from the construction equipment.

701-3.6 Overfill

Pipes shall be inspected before any overfill is in place. Any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense. Evaluation of any damage to RCP shall be evaluated based on AASHTO R73.

Overfill material shall be place and compacted in layers as required to achieve compaction to at least 95 percent standard proctor per ASTM D1557. The soil shall contain no debris, organic matter, frozen material, or stones with a diameter greater than one half the thickness of the compacted layers being placed.

701-3.7 Inspection Requirements

An initial post installation inspection shall be performed by the Contractor no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection.

Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe interior. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition. The video image shall be clear, focused, and relatively free from roll, static, or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe.

Incorporate specific inspection requirements for the various types of pipes beneath the general inspection requirements.

Flexible pipes shall be inspected for rips, tears, joint separations, soil migration, cracks, localized buckling, settlement, alignment, and deflection. Determine whether the allowable deflection has been exceeded by use of a laser profiler for internal pipe diameters of 48 inches or less, or direct measurement for internal pipe diameters greater than 48 inches. Laser profile equipment shall utilize low barrel distortion video equipment. Deflection of installed pipe shall not exceed the limits provided in the table below, as a percentage of the average inside diameter of the pipe.

Maximum Allowable Pipe Deflection

Type of Pipe	**Maximum Allowable Deflection (%)**
Corrugated Metal Pipe	5
Concrete Lined CMP	3
Thermoplastic Pipe	5

If deflection readings in excess of the allowable deflection are obtained, remove the pipe with excessive deflection and replace with new pipe. Isolated areas may exceed allowable by 2.5% with concurrence of RPR. Repair or replace any pipe with cracks exhibiting displacement across the crack, bulges, creases, tears, spalls, or delaminations. The report for flexible pipe shall include as a minimum, the deflection results and final post installation inspection report. The inspection report shall include: a copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design line and grade, and inspector's notes.

METHOD OF MEASUREMENT

701-4.1 The length of pipe shall be measured in linear feet of pipe in place, completed, and accepted. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. Each class, type and size of pipe shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

BASIS OF PAYMENT

701-5.0 These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

701-5.1 Payment will be made at the contract unit price per linear foot for Schedule 40 PVC Storm Drain Pipe, 12 inch.

Payment will be made under:

Item 701-5.1 Install 12" PVC Storm Drain Pipe - per linear foot

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M167 Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches

AASHTO M190	Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M219	Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M243	Standard Specification for Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter

ASTM International (ASTM)

ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A761	Standard Specification for Corrugated Steel Structural Plate, Zinc Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM A849	Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM B745	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
ASTM C14	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C94	Standard Specification for Ready Mixed Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe

ASTM C655	Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM C1433	Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
ASTM D1056	Standard Specification for Flexible Cellular Materials Sponge or Expanded Rubber
ASTM D3034	Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D3282	Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F894	Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2435	Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications

ASTM F2881	Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

National Fire Protection Association (NFPA)

NFPA 415	Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways

END ITEM D-701

Item D-751 Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and inspection holes, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR / Airport.

MATERIALS

751-2.1 Brick. The brick shall conform to the requirements of ASTM C32, Grade MS.

751-2.2 Mortar. Mortar shall consist of one part Portland cement and two parts sand. The cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

751-2.3 Concrete. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 Precast concrete pipe manhole rings. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches nor more than 48 inches. There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole. Gaskets shall conform to the requirements of ASTM C443.

751-2.5 Corrugated metal. Corrugated metal shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M36.

751-2.6 Frames, covers, and grates. The castings shall conform to one of the following requirements:

a. ASTM A48, Class 35B: Gray iron castings

b. ASTM A47: Malleable iron castings

c. ASTM A27: Steel castings

d. ASTM A283, Grade D: Structural steel for grates and frames

e. ASTM A536, Grade 65-45-12: Ductile iron castings

f. ASTM A897: Austempered ductile iron castings

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

751-2.7 Steps. The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of asphalt paint, when directed.

751-2.8 Precast inlet structures. Manufactured in accordance with and conforming to ASTM C913.

CONSTRUCTION METHODS

751-3.1 Unclassified excavation.

a. The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the RPR may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the RPR. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing is placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.

d. All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

e. After excavation is completed for each structure, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

751-3.2 Brick structures.

a. Foundations. A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Item P-610.

b. Laying brick. All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it that can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after the mortar has taken its set, shall be removed, cleaned, and re-laid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.

c. Joints. All joints shall be filled with mortar at every course Exterior faces shall be laid up in advance of backing. Exterior faces shall be plastered or parged with a coat of mortar not less than 3/8 inch thick before the backing is laid up. Prior to parging, all joints on the back of face courses shall be cut flush. Unless otherwise noted, joints shall be not less than 1/4 inch nor more than 1/2 inch wide and the selected joint width shall be maintained uniform throughout the work.

d. Pointing. Face joints shall be neatly struck, using the weather-struck joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.

e. Cleaning. Upon completion of the work all exterior surfaces shall be thoroughly cleaned by scrubbing and washing with water. If necessary to produce satisfactory results, cleaning shall be done with a 5% solution of muriatic acid which shall then be rinsed off with liberal quantities of water.

f. Curing and cold weather protection. The brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost on the brick or when the air temperature is below 50°F unless the Contractor has, on the project ready to use, suitable covering and artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60°F for the duration of the curing period.

751-3.3 Concrete structures. Concrete structures which are to be cast-in-place within the project boundaries shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

All invert channels shall be constructed and shaped accurately to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

751-3.4 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the plans. All precast concrete sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall: (1) be smoothed to a uniform surface on both interior and exterior of the structure or (2) utilize a rubber gasket per ASTM C443. The top of the upper precast concrete section shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal or metal encapsulated steps that are embedded or built into the side walls shall be aligned and placed in accordance to ASTM C478. When a metal ladder replaces the steps, it shall be securely fastened into position.

751-3.5 Corrugated metal structures. Corrugated metal structures shall be prefabricated. All standard or special fittings shall be furnished to provide pipe connections or branches with the correct dimensions and of sufficient length to accommodate connecting bands. The fittings shall be welded in place to the metal structures. The top of the metal structure shall be designed so that either a concrete slab or metal collar may be attached to allow the fastening of a standard metal frame and grate or cover. Steps or ladders shall be furnished as shown on the plans. Corrugated metal structures shall be constructed on prepared foundations, conforming to the dimensions and locations as shown on the plans. When indicated, the structures shall be placed on a reinforced concrete base.

751-3.6 Inlet and outlet pipes. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with the wall on the inside surface of the structure, unless otherwise directed. For concrete or brick structures, mortar shall be placed around these pipes to form a tight, neat connection.

751-3.7 Placement and treatment of castings, frames, and fittings. All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the RPR, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are placed on previously constructed masonry, the bearing surface of the masonry shall be brought true to line and grade and shall present an even bearing surface so the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the plans or as directed by the RPR. All units shall set firm and secure.

After the frames or fittings have been set in final position, the concrete or mortar shall be allowed to harden for seven (7) days before the grates or covers are placed and fastened down.

751-3.8 Installation of steps. The steps shall be installed as indicated on the plans or as directed by the RPR. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is placed. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least seven (7) days. After seven (7) days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete structures they shall meet the requirements of ASTM C478. The steps shall be cast into the side of the sections at the time the sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches.

Instead of steps, prefabricated ladders may be installed. For brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. For metal structures, the ladder shall be secured by welding the top support to the structure and grouting the bottom support into drilled holes in the foundation or as directed by the RPR.

751-3.9 Backfilling.

a. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

b. Backfill shall not be placed against any structure until approved by the RPR. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

751-4.1 Manholes, catch basins, inlets, and inspection holes shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, inlets, and inspection holes will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-5.1	18” x 18” Catch Basin - per each
Item D-751-5.2	Connect New Storm Drain Pipe to Existing Catch Basin - per each
Item D-751-5.3	Adjust Existing Catch Basin Frame and Grate to Grade - per each

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C32	Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections

ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M36	Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

END OF ITEM D-751

Item L-110 Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits and removal of existing duct banks. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be neatly organized tabbed by specification section, and electronically submitted in pdf format. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and

1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth."

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I–Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II–Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches per 100 feet. On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches below the subgrade; in other locations, the top of the duct bank or underground conduit shall be be not less than 18 inches below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be recleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet.

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching

equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch sieve. Flowable backfill may alternatively be used

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet.

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables) cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

a. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet beyond the edges of the pavement or 3 feet beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches wide tape, 8 inches minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch wide tape only for single conduit runs. Utilize the 6-inch wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Trenches for single-conduit lines shall be not less than 6 inches nor more than 12 inches wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet square and 4 - 6 inches thick extending approximately one inch above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word “DUCT” or “CONDUIT” on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches high and 3 inches wide with width of stroke 1/2 inch and 1/4 inch deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 8 inches of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 “Excavation and Embankment” except that the material used for backfill shall be select material not larger than 4 inches in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet of duct bank or one work period’s construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to it's original condition. The restoration shall include asphalt pavement repair, concrete pavement repair, sodding, topsoiling, seeding, mulching, and hydroseeding shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD) and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 Ownership of removed cable. The ownership of removed cable shall be the Contractor's. Contractor shall have sole responsibility for the removal, temporary storage, and disposal of removed cable, conduit, wire, and associated debris.

110-3.9 Miscellaneous Airfield Electrical Removals and Connections. Various removals and connections of electrical infrastructure will be required that are not otherwise accounted for in existing bid items. Those items include, but are not limited to:

a. Removal of existing cable: Cable shall be removed from all conduits identified on the plans prior to removing conduit and electrical structures. Any removed cable remaining by the end of the Project shall be disposed off-site.

b. Removal of existing conduit: Existing conduit that is no longer needed within the Project site, as identified on the plans, shall be removed if encountered during trenching operations. Additionally, any existing conduit that is located within the new pavement and shoulder limits must be concrete encased or rerouted prior to lime-treatment of the subgrade or placement of subbase. This item will also include removal of slurry or concrete encasement, if encountered.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

110-4.2 Removal of Existing Cable and Conduit will be measured per linear foot measured the conduit, completely removed, and accepted by the RPR, regardless of the number of cables contained in the conduit. This item shall include the identification of cable(s) needing to be removed along with all other cables routed in the same duct, handhole, manhole or junction can and all required megger testing. The removal of cabling from a conduit, regardless of the number of times cabling is removed from that conduit, will only be measured once per conduit run.

110-4.3 Removal of Existing Conduit will be measured per linear foot measured the conduit, completely removed, and accepted by the RPR. This item shall include the identification of conduit(s) needing to be removed along with all other conduit routed in the same duct.

110-4.4 Removal of Existing Cable will be measured per linear foot measured along the conduit. The cable shall be completely removed and accepted by the RPR. This item shall include the identification of the cable(s) needing to be removed, and removal/reinstallation of any lids, light fixtures and connectors shall be incidental.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

110-5.2 Remove Existing Cable and Conduit will be paid at the Contract unit price per linear foot completely removed and accepted by the RPR. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete this item. This price shall also include all testing and if necessary, cable repair or replacement due to damage caused by cable removal.

110-5.3 Remove Existing Conduit will be paid at a at the Contract unit price per linear foot completely removed and accepted by the RPR. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete this item. This price shall also include all testing and if necessary, cable repair or replacement due to damage caused by conduit removal.

110-5.4 Remove Existing Cable will be paid at a at the Contract unit price per linear foot completely removed and accepted by the RPR. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete this item. This price shall also include all testing and if necessary, cable repair or replacement due to damage caused by cable removal.

Payment will be made under:

Item L-110-5.1	Remove Existing Cable and Conduit - per linear foot

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circular (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit - Steel

UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 1242	Electrical Intermediate Metal Conduit Steel
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

END OF ITEM L-110

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Item P-101 Preparation/Removal of Existing Pavements

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 1.5 inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. If the material is to be wasted on the airport site, it shall be broken to a maximum size of 1.5 inches.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch wide) with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch, not to exceed ¼ inch. Any excess joint or crack sealer shall be removed from the pavement surface.

101-3.3 Removal of Foreign Substances/contaminates prior to overlay / surface treatment. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

Chemicals, high-pressure water, or cold milling may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. Not Used.

b. Asphalt pavement repair. The Contractor shall repair all failed asphalt as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed off Airport property. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense.

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The Contractor shall layout the area to be milled with a straightedge in increments of 1-foot widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 1 foot and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of off the airport.

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed off Airport property.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

b. Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

101-3.7 Maintenance. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.

101-3.8.1 Removal of Existing Joint Sealant. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

101-3.8.2 Cleaning prior to sealing. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 Joint sealant. Joint material and installation will be in accordance with Item P-605.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with router by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by routing. Following routing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with Item P-605.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. Remove the types of pipe as indicated on the plans. The pipe material shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D1557.

b. Removal of Inlets/Manholes. Where indicated on the plans or as directed by the RPR, inlets and/or manholes shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. When under paved areas must be compacted to 95% of ASTM D1557, when outside of paved areas must be compacted to 95% of ASTM D698.

c. Removal of Existing Water Valves/Boxes/Lines and Hydrants. Where indicated on the plans or as directed by the RPR, water valves, boxes, lines, and hydrants shall be removed and/or salvaged per the Plans and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. When under paved areas must be compacted to 95% of ASTM D1557, when outside of paved areas must be compacted to 95% of ASTM D698.

101-3.9.5 Miscellaneous Demolition and Removals.

a. Removal of Existing Bollards. Remove the bollards and the associated foundations as indicated on the plans. The removal material shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D1557.

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. Dowel bar installation shall be incidental to pavement removal.

101-4.2 Removal of Pipe and other Buried Structures. The unit of measurement for removal of pipe and other buried structures will be made at the contract unit price for each completed and accepted item. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.4.

101-4.3 Removal of Existing Bollards. The unit of measurement for removal of existing bollards will be made at the contract unit price for each completed and accepted item. This price shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 101-3.9.5.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P 101-5.1	Asphalt Concrete Pavement Removal - per square yard
Item P 101-5.2	Concrete Pavement Removal - per square yard
Item P 101-5.3	Concrete Sidewalk Pavement Removal - per square yard
Item P 101-5.4	Demolish Existing Valve Box and Protect Valve in Place - per each
Item P 101-5.5	Remove, Salvage, and Cap Existing Fire Hydrant - per each
Item P 101-5.6	Remove Existing Bollards - per each

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circulars (AC)

AC 150/5380-6	Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

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Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

a. Unclassified excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature.

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of in waste areas as shown on the plans. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches, to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches in their greatest dimension will not be permitted in the top 6 inches of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

a. Blasting. Blasting shall not be allowed.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot of the stated elevations for ground surfaces, or within 0.04 foot for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the plans. The cost is incidental to this item. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as unclassified excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. Borrow areas are not required.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, perform subgrade compaction as shown on the plans utilizing ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches nor more than 12 inches of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications.

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each lift shall be within ±2% of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The Contractor will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D698. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the Contractor for every 3,000 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D698. Under all areas to be paved, the embankments shall be compacted as shown on the plans as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The Contractor’s laboratory shall perform all density tests in the RPR’s presence and provide the test results upon completion to the RPR for acceptance. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches in their greatest dimensions will not be allowed in the top 12 inches of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in lifts not exceeding 2 feet in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet below the finished subgrade.

Payment for compacted embankment will be made under embankment-in-place.

152-2.9 Proof rolling. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, and after compaction is completed, the subgrade area shall be proof rolled with a Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 80/100/150 psi in the presence of the RPR. Apply a minimum of 25% coverage, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch or show permanent deformation greater than 1 inch shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to depths and percentages as shown on the plans as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch sieve, follow the methods in ASTM D1557. Tests for moisture content and compaction will be taken at a minimum of 3,000 S.Y. of subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

The in-place field density shall be determined in accordance with ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface shall not vary more than +/- ½ inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.

b. Grade. The grade and crown shall be measured on a 50-foot grid and shall be within +/-0.05 feet of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to placed, grade shall not vary more than 0.10 feet from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. Not used.

METHOD OF MEASUREMENT

152-3.1 The quantity of unclassified excavation to be paid for shall be the number of square yards measured in its original position. Measurement shall not include the quantity of materials excavated

without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.2 The quantity of subgrade preparation shall be the number of square yards measured in its original position. Measurement shall not include the quantity of subgrade preparation without authorization beyond normal slope lines, or the quantity of preparation used for purposes other than those directed.

BASIS OF PAYMENT

152-4.1 Unclassified excavation payment shall be made at the contract unit price per square yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2 For subgrade preparation, payment shall be made at the contract unit price per square yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-4.1	Unclassified Excavation - per square yard
Item P-152-4.2	Subgrade Preparation - per square yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2	Operational Safety on Airports During Construction Software

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66	Design and Construction of Airport Pavements on Expansive Soils

END OF ITEM P-152

Item P-153 Controlled Low-Strength Material (CLSM)

DESCRIPTION

153-1.1 This item shall consist of furnishing, transporting, and placing a controlled low-strength material (CLSM) as flowable backfill in trenches or at other locations shown on the plans or as directed by the Resident Project Representative (RPR).

MATERIALS

153-2.1 Materials.

a. Cement. Cement shall conform to the requirements of ASTM C150, Types I, or II.

b. Fly ash. Fly ash shall conform to ASTM C618, Class C or F.

c. Fine aggregate (sand). Fine aggregate shall conform to the requirements of ASTM C33 except for aggregate gradation. Any aggregate gradation which produces the specified performance characteristics of the CLSM and meets the following requirements, will be accepted.

Sieve Size	Percent Passing by weight
3/4 inch	100
No. 200	0 - 12

d. Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

MIX DESIGN

153-3.1 Proportions. The Contractor shall submit, to the RPR, a mix design including the proportions and source of aggregate, fly ash, cement, water, and approved admixtures. No CLSM mixture shall be produced for payment until the RPR has given written approval of the proportions. The proportions shall be prepared by a laboratory and shall remain in effect for the duration of the project. The proportions shall establish a single percentage or weight for aggregate, fly ash, cement, water, and any admixtures proposed. Laboratory costs are incidental to this item.

a. Compressive strength. CLSM shall be designed to achieve a 28-day compressive strength of 100 to 200 psi when tested in accordance with ASTM D4832, with no significant strength gain after 28 days.

b. Consistency. Design CLSM to achieve a consistency that will produce an approximate 8-inch diameter circular-type spread without segregation. CLSM consistency shall be determined per ASTM D6103.

CONSTRUCTION METHODS

153-4.1 Placement.

a. Placement. CLSM may be placed by any reasonable means from the mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed so structures or pipes are not displaced from their final position and intrusion of CLSM into unwanted areas is avoided. The material shall be brought up uniformly to the fill line shown on the plans or as directed by

the RPR. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one lift, the base lift shall be free of surface water and loose foreign material prior to placement of the next lift.

b. Contractor Quality Control. The Contractor shall collect all batch tickets to verify the CLSM delivered to the project conforms to the mix design. The Contractor shall verify daily that the CLSM is consistent with 153-3.1a and 153-3.1b. Adjustments shall be made as necessary to the proportions and materials as needed. The Contractor shall provide all batch tickets to the RPR.

c. Limitations of placement. CLSM shall not be placed on frozen ground. Mixing and placing may begin when the air or ground temperature is at least 35°F and rising. Mixing and placement shall stop when the air temperature is 40°F and falling or when the anticipated air or ground temperature will be 35°F or less in the 24-hour period following proposed placement. At the time of placement, CLSM shall have a temperature of at least 40°F.

153-4.2 Curing and protection

a. Curing. The air in contact with the CLSM shall be maintained at temperatures above freezing for a minimum of 72 hours. If the CLSM is subjected to temperatures below 32°F, the material may be rejected by the RPR if damage to the material is observed.

b. Protection. The CLSM shall not be subject to loads and shall remain undisturbed by construction activities for a period of 48 hours or until a compressive strength of 15 psi is obtained. The Contractor shall be responsible for providing evidence to the RPR that the material has reached the desired strength. Acceptable evidence shall be based upon compressive tests made in accordance with paragraph 153-3.1a.

153-4.3 Quality Assurance (QA) Acceptance. CLSM QA acceptance shall be based upon batch tickets provided by the Contractor to the RPR to confirm that the delivered material conforms to the mix design.

METHOD OF MEASUREMENT

153-5.1 Measurement.

No separate measurement for payment shall be made for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

BASIS OF PAYMENT

153-6.1 Payment.

No payment will be made separately or directly for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C33	Standard Specification for Concrete Aggregates
ASTM C150	Standard Specification for Portland Cement

ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D4832	Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders
ASTM D6103	Flow Consistency of Controlled Low Strength Material (CLSM)

END OF ITEM P-153

Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F or above; the temperature has not been below 35°F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour or seven (700) feet per minute.

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY	Emulsion Application Bar Rate, gal/SY
New asphalt	0.02-0.05	0.03-0.07
Existing asphalt	0.04-0.07	0.06-0.11
Milled Surface	0.04-0.08	.0.06-0.12
Concrete	0.03-0.05	0.05-0.08

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 No separate measurement for payment shall be made for emulsified asphalt material for tack coat. Emulsified asphalt material for tack coat shall be considered necessary and incidental to the work of this Contract.

BASIS OF PAYMENT

603.5-1 Payment.

No payment will be made separately or directly for emulsified asphalt tack coat. Emulsified asphalt tack coat shall be considered necessary and incidental to the work of this Contract.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END ITEM P-603

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PROJECT MANUAL

San Luis Obispo County Regional Airport Baggage Screening Mods

Mead & Hunt Project Number: 1943000-22814.02

San Luis Obispo, California

Prepared for:
County of San Luis Obispo Regional Airport

Mead&Hunt
9600 NE Cascades Parkway, Suite 100
Portland, Oregon 97220
Phone: 503-548-1494
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Issued For: Permit/Bid Set
June 22, 2026

Certificate and Seals
for
San Luis Obispo County Airport (SBP)
Baggage Screening Modifications

San Luis Obispo, Califiornia

Mead & Hunt, Inc.
1943000-22814.02

ISSUED FOR PERMIT

Prepared for:

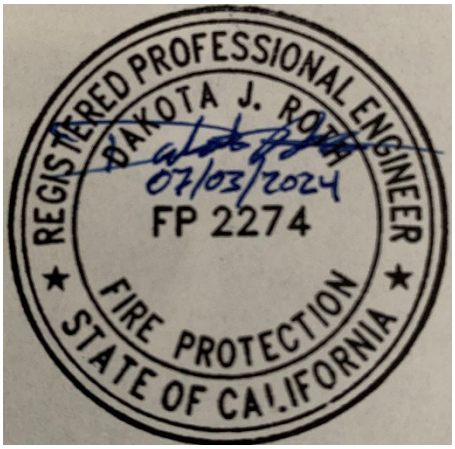
San Luis Obispo County

Prepared by:

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June 22, 2026

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Contractor's use of site and premises.
5. Coordination with occupants.
6. Work restrictions.

1.2 DEFINITIONS

A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.3 PROJECT INFORMATION

A. Project Identification: 1943000-222814.02.

1. Project Location: 975 Airport Drive, San Luis Obispo, California, 93401, United States.

B. Owner: County of San Luis Obispo, Department of Airports, 975 Airport Drive, San Luis Obispo, California, 93401, United States.

1. Owner's Representative: Patrick Simas, psimas@co.slo.ca.us, 805-781-1183.

C. Architect: Mead & Hunt, Inc., 2440 Deming Way, Middleton, Wisconsin, 53562.

1. Architect's Representative: Mead & Hunt, Inc.

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. Architect: Mead & Hunt.

E. Other Owner Consultants: Owner has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Structural Engineer: Buehler has prepared the structural design portions of the Contract Documents
2. Baggage Handling Systems: Logplan has prepared the following portions of the Contract Documents

a. BHS Representative: Kyle Thomas

F. Contractor: TBD

1. Contractor Representative: TBD

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. Project and other Work indicated in the Contract Documents.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Each Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy Project site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work to between 7 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.

1. Weekend Hours: as needed; confirm with SBP.
2. Early Morning Hours: as needed, confirm with SBP.
3. Work in Existing Building: as needed; confirm with SBP.
4. Hours for Utility Shutdowns: as needed; confirm with SBP.
5. Hours for Core Drilling: as needed; confirm with SBP.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on Owner's property is not permitted.

F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Unit-cost allowances.
3. Quantity allowances.

C. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.2 DEFINITIONS

A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain, and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.7 UNIT-COST ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain, and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor’s overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.10 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

C. Costs of testing and inspection services not specifically required by the Contract Documents are Contractor responsibilities and are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.11 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Quantity Allowance: Include 2000 cu. yd. of unsatisfactory soil excavation and disposal off-site and replacement with satisfactory soil material from off-site, as specified in Section 312000 "Earth Moving."

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

B. Allowance No. 2: Quantity Allowance: Include 1000 cu. yd. of mass rock removal and replacement with satisfactory soil material, as specified in Section 312000 "Earth Moving."

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

C. Allowance No. 3: Quantity Allowance: Include 10 cu. yd. of trench rock removal and replacement with satisfactory soil material, as specified in Section 312000 "Earth Moving."

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

D. Allowance No. 5: Unit-Cost Allowance: Include the sum of $350.00 per thousand for buff-colored face brick, as specified in Section 042000 "Unit Masonry" and as shown on Drawings.

E. Allowance No. 6: Quantity Allowance: Include 5000 sq. yd. of Carpet Type 1 installed, including urethane foam carpet cushion and related amount of tackless strip, as specified in Section 096816 "Sheet Carpeting."

F. Allowance No. 7: Contingency Allowance: Include a contingency allowance of $100,000.00 for use according to Owner's written instructions.

G. Allowance No. 8: Testing and Inspection Allowance: Include the sum of $1,000.00 for testing concrete to be provided by Owner, as specified in Section 033000 "Cast-in-Place Concrete."

END OF SECTION 012100

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Document 002600 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
2. Section 012100 "Allowances" for products selected under an allowance.
3. Section 012300 "Alternates" for products selected under an alternate.
4. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form:

a. Use CSI Form 13.1A for substitution request after bid.
b. Use section 004325: CSI Form 1.5C for substitution requests during bidding.

2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified product or fabrication, or installation method cannot be provided, if applicable.
    b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. Certificates and qualification data, where applicable or requested.
    g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
    h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
    i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
    j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
    k. Cost information, including a proposal of change, if any, in the Contract Sum.
    l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
    m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

    a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
    b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed unless otherwise indicated.

C. Or Equal Substitutions: Submit using the CSI Form 13.1A and meet all requirements and definitions of the specified product contained in these documents and in the manufacture’s product data and properties. See “or equal” definition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

Advancement of Construction Technology

SUBSTITUTION REQUEST

(During the Bidding Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

A/E= s REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

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Knowledge for Creating and Sustaining the Built Environment

SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Phone: _____

Address: _____

Trade Name: _____ Model No.: _____

Installer: _____ Phone: _____

Address: _____

History: ☐ New product ☐ 1-4 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product:

☐ Point-by-point comparative data attached — REQUIRED BY A/E

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

_____

Savings to Owner for accepting substitution: _____ ($ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

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Form Version: June 2004
CSI Form 13.1A

SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase — Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: ☐

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ Other:

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SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request or seven (7) days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    e. Quotation Form: Use forms provided by the Architect.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use forms provided by the Architect.

1.4 ADMINISTRATIVE CHANGE ORDERS

A. Unit Price Adjustment: Refer to Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements. Equally Note:

1. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
2. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
3. Division 01 Section "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the contract amount to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's construction schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.
b. Submittal schedule.
c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the Schedule of Values to the Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual Table of Contents as a guide to establish line items for the Schedule of Value. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

   a. Project name and location.
   b. Name of Architect.
   c. Owner’s project and contract number
   d. Architect's project number.
   e. Contractor's name and address.
   f. Date of submittal.

2. Arrange Schedule of Values consistent with format of AIA Document G703.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Change Orders (numbers) that affect value.
   d. Dollar value as a percentage of the Bid to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts where appropriate.
5. Round amounts to nearest whole dollar; total shall equal contract sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

9. Provide a separate line item for the following portions of the work:

   a. Close-out documentation required in appropriate sections of Division 1 General Requirements and Technical Specifications sections. Value established for this item shall be subject to approval by Architect.

10. Schedule of Values Updates: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as forms for Applications for Payment.

C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

D. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Payment for materials on hand shall be in accordance with specification requirements.
2. Provide summary documentation for stored materials indicating the following:

a. Materials previously stored and included in previous Applications for Payment.
b. Work completed for this Application utilizing previously stored materials.
c. Additional materials stored with this Application.
d. Total materials remaining stored, including materials with this Application.

E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.

3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Schedule of unit prices (if applicable).
6. Submittal schedule (preliminary if not final).
7. Copies of building permits.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
5. AIA Document G707, "Consent of Surety to Final Payment."
6. Evidence that claims have been settled.
7. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Administrative and supervisory personnel.
3. Coordination drawings.
4. Requests for Information (RFIs).
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

1.2 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements. Equally Note:

1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.
4. Division 01 Section "General Commissioning Requirements" for coordinating the Work with Owner's commissioning authority.
5. Related portions of General Provisions and Special Provisions.

1.3 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 KEY PERSONNEL

A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field offices, and by each temporary telephone. Keep list current at all times.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.

7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for coordination information already indicated in the Contract Documents.
    d. Requests for adjustments in the Contract Time or the Contract Sum.
    e. Requests for interpretation of Architect's actions on submittals.
    f. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.

4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 30 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Submittal procedures.
    l. Sustainable design requirements.
    m. Preparation of record documents.
    n. Use of the premises.
    o. Work restrictions.
    p. Working hours.
    q. Owner's occupancy requirements.
    r. Responsibility for temporary facilities and controls.
    s. Procedures for moisture and mold control.

t. Procedures for disruptions and shutdowns.
u. Construction waste management and recycling.
v. Parking availability.
w. Office, work, and storage areas.
x. Equipment deliveries and priorities.
y. First aid.
z. Security.
aa. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Commissioning Authority, of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at weekly intervals, unless otherwise arranged based on project activity.

1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site utilization.
        8) Temporary facilities and controls.
        9) Progress cleaning.
        10) Quality and work standards.
        11) Status of correction of deficient items.
        12) Field observations.
        13) Status of RFIs.
        14) Status of proposal requests.
        15) Pending changes.
        16) Status of Change Orders.
        17) Documentation of information for payment requests.

3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Standard Specifications, Proposal Documents, Special Provisions, Supplemental Specifications, Bid Item Manual and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's construction schedule.
2. Daily construction reports.
3. Material location reports.
4. Field condition reports.
5. Special reports.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements. Equally Note:

1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
2. Related portions of General Provisions and Special Provisions.

1.4 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.5 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Two paper copies.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

C. Daily Construction Reports: Submit at monthly intervals.

D. Material Location Reports: Submit at monthly intervals.

E. Field Condition Reports: Submit at time of discovery of differing conditions.

F. Special Reports: Submit at time of unusual event.

G. Qualification Data: For scheduling consultant.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
2. Startup and Testing Time: Include not less than 15 days for startup and testing.
3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
4. Punch List and Final Completion: Include not more than 30 days for punch list and final completion.

C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

1. Include critical milestones established in the Special Provisions.

D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required achieving compliance, and dating by which recovery will be accomplished.

E. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice of Award. Base schedule on the start-up construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Standard Specifications, Proposal Documents, Special Provisions, Supplemental Specifications, Bid Item Manual, and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements submitting shop drawings, product data, samples, and other for submittals.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements. Equally Note:

1. Section 012500 "Substitution Procedures" for submitting substitutions for material and product requirements specified.
2. Section 012900 “Payment Procedures” for submitting Applications for Payment and the schedule of values
3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
8. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
9. Related portions of General Provisions, Special Provisions, Standard Specifications and Technical Specifications.

1.4 DEFINITIONS

A. Pre-Construction Submittals: Those submittals that are required to be submitted and approved by the Owner and Architect prior to commencement of construction and before sub-contractor mobilization.

B. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's or Owner's Authorized Representative's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

C. Informational Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's or Owner's Authorized Representative's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

D. Closeout Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's or Owner's Authorized Representative's responsive action that are submitted at project closeout, refer to Section 017700 – Closeout Procedures. Submittals may be rejected for not complying with requirements. Closeout submittals are those submittals indicated in individual Specification Sections as "closeout submittals."

E. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

F. Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription," of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

G. Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed."

H. Substitutions: For Contractor-proposed substitution requests, refer to Section 012500 – Substitution Procedures.

1.5 SUBMITTAL LOG

A. Submittal Log: Contractor shall use, as an example, the submittal log attached to this Section that includes a list of submittals, arranged by Division and Section. The log includes time required for review by the Architect/Engineer, Owner, or Owner's Authorized Representative for each submittal listed. MS Excel format of the document will be provided to the Contractor at the preconstruction meeting for use in developing their own submittals and log.

1. Each Section in the Submittal Log includes the submittals required in the specification manual(s). There are different types of submittals that may be included in each Section. The submittal types are:

    a. Pre-Construction Submittals (PC)
    b. Action submittals (A),
    c. Informational submittals (I),
    d. Closeout submittals (C),
    e. Refer to "Definitions" Article for descriptions of each submittal type.

2. It is a Pre-Construction requirement for the General Contractor to fill-out the Submittal Log with approximate dates showing when the submittal line items will be submitted for review.

    a. Required Pre-Construction Submittal

1.6 SUBMITTAL PROCEDURES

A. Architect/Engineer Digital Data Files: Electronic copies of CAD drawings of the contract drawings will not be provided for Contractor's use in preparing shop drawings.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect/Engineer or Owner's Authorized Representative reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of contract documents.

D. Contractor shall be responsible for quantities and dimensions shown on submittals taken from Contract Drawings.

E. Make submittals promptly in such sequence as to cause no delay in Work. Only the Contractor shall submit submittals to Architect/Engineer's or Owner's Authorized Representative's. Contractor shall number transmittals consecutively and shall indicate the submittal procedure number being followed.

F. All submittals shall include the Contractor's Material Submittal Cover form. Reference the attached sample copy for completion of the document. Complete all fields in the Contractor's Material Submittal Cover form that are highlighted with RED text in the sample copy. MSWord format of the document will be provided to the Contractor at the preconstruction meeting for use in developing submittals.

1. Each submittal item shall be listed individually on the Material Submittal Cover.
2. Provide one submittal for each Section. Do not combine Sections unless material for the Sections are dependent on each other.
3. Include list of drawings with shop drawing submittals.

4. Provide field dimensions, clearly identified as such, as applicable where requested by subcontractor or fabricator.
5. Relation to adjacent or critical features of Work or materials, as applicable.
6. Applicable standards, such as ASTM of Federal Specification numbers.
7. Identification of deviations from Contract Drawings.
8. Identification of revisions on the resubmitted.
9. Additional information as required by Contract Documents.
10. 8" x 3" blank space for Contractor's approval stamp and Architect/Engineer stamps.
11. Contractor's approval stamp.

G. Options: Identify options requiring selection by Architect.

H. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

I. Apply the Contractor's approval stamp, signed may be provided on a transmittal cover sheet for the entire submittal or on each sheets of shop drawings, on cover sheet of each product data item, and on stamp sheet of each sample certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of information within submittal with requirements of Work and of Contract Documents. Use of electronic stamps and signatures are permitted.

1. Contractor's stamp shall only note that the submittal has been approved. The use of words or phrases such as "reviewed" or "reviewed as noted" is not acceptable.

J. Submittals without Contractor's approval stamp and submittals which, in Architect/Engineer's or Owner's Authorized Representative's opinion are incomplete, contain numerous errors, or have not been checked or have only been checked superficially, will be returned without comments. Any resulting delays shall be Contractor's responsibility.

K. Action Submittal Requirements: All action submittals required for each Section must be provided in a single submission for review. Partial submittals are not permitted and will be returned without comment. Where partial submittals are necessary the Contractor shall coordinate with Architect/Engineer or Owner's Authorized Representative.

L. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in the Submittal Log and the individual Specification Sections.

1. Email: Prepare submittals as PDF package and transmit to Architect/Engineer or Owner's Authorized Representative by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.

a. Architect/Engineer or Owner's Authorized Representative will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
b. Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination

M. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect/Engineer or Owner's Authorized Representative action stamp.
4. Allow 15 days for review of each resubmittal.

N. Fabrication of products or beginning work prior to the return of approved submittals is at the risk of the Contractor.

O. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

P. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.7 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams that show factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Compliance with specified standards.
    d. Notation of coordination requirements.
    e. Notation of dimensions established by field measurement.
    f. Relationship and attachment to adjoining construction clearly indicated.
    g. Seal and signature of professional engineer if specified.

2. Submit Shop Drawings in Electronic PDF format.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

    a. Project name and submittal number.
    b. Generic description of Sample.
    c. Product name and name of manufacturer.
    d. Sample source.
    e. Number and title of applicable Specification Section.
    f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the

following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit sets of Samples. Architect will retain one Sample set; remainder will be returned.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.8 OR EQUAL SUBMITTAL REQUIREMENTS

A. Refer to section 012500

1.9 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: refer to section 013573

B. Delegated-Design Services Certification: refer to section 013573

1.10 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return it.

1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.

B. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

C. Architect will return without review submittals received from sources other than Contractor.

D. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SCHEDULE OF MATERIAL SUBMITTALS List Is provided for informational purposes. It is the Contractor's responsibilies to make sure ALL submittals listed in the specifications are submitted even if they have been ommited from this list.	PROJECT NUMBER	PROJECT TITLE	PROJECT LOCATION
	194300-222814.02	**San Luis Obispo County Regional Airport Baggage Screening Modifications**	**San Luis Obispo County Regional Airport, San Luis Obispo, CA**
Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

Electronic Submittal Required, Unless Noted Otherwise											STATUS CODE						
LINE NUMBER	RESPONSIBLE REVIEWER	TYPE OF SUBMITTAL	Submittal ID #	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL TYPES OF SUBMITTALS A = ACTION SUBMITTAL I = INFORMATIONAL SUBMITTAL C = CLOSEOUT SUBMITTAL		REQUIRED SUBMITTAL DATE	SUBMITTAL NUMBER (SPEC. SECTION NUMBER-0XX) 000000-000	CONTRACTOR SUBMITTAL DATE	A/E REVIEW DATE	RESUBMITTAL DATE IF REVISED	No Exceptions Taken	Approved as Noted - No Resubmittal Required	Revise and Resubmit	Acknoledge Receipt	Reject	Not Required	REMARKS
				012500 - Substitution Procedures				-	-	-	-	-	-			-	
1	PM	A	012500.A.01	1.4.A	Substitution Requests	Note 4											
				013200 - Construction Progress Documentation				-	-	-	-	-	-			-	
2	PM	I	013200.I.01	1.5.B	Contractor Construction Schedule	Note 3											
				013513 - Special Project Procedures				-	-	-	-	-	-			-	
3	PM	A	013513.A.01	1.4.A	Construction Safe and Phasing Plan (CSPP)	Note 1			N/A								
4	PM	I	013513.I.01	1.5.A	Safety Plan Compliance Document (SPCD)	Note 1			N/A								
				013573 - Delegated Design Procedures				-	-	-	-	-	-			-	
5	PM	A	013573.A.01	1.6.A	Qualifications of the Contractor-Hired Design Professional	Note 1			N/A								
6	PM	A		1.6.B	Delegated-Design Submittal	Note 1			N/A								
7	PM	I	013573.I.01	1.7.A	Delegated Construction Submittals	Note 3			N/A								
				014000 - Quality Requirements				-	-	-	-	-	-			-	
8	PM	I	014200.I.01	1.6.A	Testing Agency Qualification	Note 1			N/A								
9	PM	I	014200.I.02	1.6.B	Schedule of Tests and Inspections	Note 1			N/A								
				014150 - Special Inspections and Structural Testing				-	-	-	-	-	-			-	
10	PM	A	014150.A.01	1.8.A	Special Inspector and Testing Laboratory submit to Owner & Architect	Note 1			N/A								
11	PM	A		1.8.B	Special Inspector and Testing Laboratory disclose Business Relationship	Note 1			N/A								
				014339 - Mockups				-	-	-	-	-	-			-	
10	PM	A	041339.A.01	1.4.A	Product Data	Note 3											
16	PM	A		1.4.B	Shop Drawings	Note 3											
17	PM	A		1.4.C	Schedule	Note 3											
18	PM	A		1.4.D	Delegated Design Submittal	Note 3											
19	PM	I	041339.I.01	1.5.A	Room Mockup Coordination Drawings	Note 3											
				015000 - Temporary Facilities and Controls				-	-	-	-	-	-			-	
20	PM	I	015000.I.01	1.6.A	Site Utility Plan	Note 2			N/A								
21	PM	I		1.6.B	Implementation and Termination Schedule	Note 2			N/A								
				016000 - Product Requirements				-	-	-	-	-	-			-	
22	PM	I	016000.A.01	1.6.A	Comparable Product Requests	Note 2			N/A								
23	PM	I		1.6.B	Basis of Design Product Specification	Note 2			N/A								
				017000 - Execution & Closeout Requirements				-	-	-	-	-	-			-	
24	PM	I	017000.I.01	1.5.A	Qualification Data - Land Surveyor	Note 2			N/A								
25	PM	I	017000.I.02	1.5.B	Certificates - Location & Elevation	Note 2			N/A								
				017419 - Construction Waste Management and Disposal				-	-	-	-	-	-			-	
26	PM	A	017419.A.01	1.6.A	Construction and Demolition Waste Management Plan	Note 9											
27	PM	I	017419.I.01-*	1.5.A	Waste Reduction Progress Reports	Note 9											
28	PM	I	017419.I.02-*	1.5.B	Waste Reduction Calculations	Note 9											
29	PM	I	017419.I.03-*	1.5.C	Records of Donations	Note 9											
30	PM	I	017419.I.04-*	1.5.D	Records of Sales	Note 9											
28	PM	I	017419.I.05-*	1.5.E	Recycling and Processing Facility Records	Note 9											

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Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

Electronic Submittal Required, Unless Noted Otherwise											STATUS CODE						
LINE NUMBER	RESPONSIBLE REVIEWER	TYPE OF SUBMITTAL	Submittal ID #	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL TYPES OF SUBMITTALS A = ACTION SUBMITTAL I = INFORMATIONAL SUBMITTAL C = CLOSEOUT SUBMITTAL		REQUIRED SUBMITTAL DATE	SUBMITTAL NUMBER (SPEC. SECTION NUMBER-0XX) 000000-000	CONTRACTOR SUBMITTAL DATE	A/E REVIEW DATE	RESUBMITTAL DATE IF REVISED	No Exceptions Taken	Approved as Noted - No Resubmittal Required	Revise and Resubmit	Acknoledge Receipt	Reject	Not Required	REMARKS
31	PM	I	017419.I.06-*	1.5.F	Landfill and Incineratopr Disposal Records	Note 9											
32	PM	I	017419.I.07-*	1.5.G	Coordinate "Qualification Data" with Qualification Requirements	Note 9											
33	PM	I	017419.I.08-*	1.5.H	Qualification Data	Note 9											
34	PM	I	017419.I.09-*	1.5.I	Statement of Refrigerant Recovery	Note 9											
35	PM	I	017419.I.10-*	1.5.J	Refrigerant Recovery	Note 9											
				017700 - Closeout Procedures				-	-	-	-	-	-			-	
36	PM	C	017700.C.01	1.4.A	Certificates of Release	Note 9											
37	PM	C	017700.C.01	1.4.B	Certificate of Insurance	Note 9											
				017823 - Operation and Maintenance Data				-	-	-	-	-	-			-	
38	PM	C	017823.C.01	1.4.A	Manual	Note 9											
				017839 - Project Record Documents				-	-	-	-	-	-			-	
39	PM	C	017839.C.01	1.5.A	As-built drawings and specifications	Note 9											
40	PM	C		1.5.B	Record Drawings	Note 9											
41	PM	C		1.5.C	Record Specifications	Note 9											
				017900 - Demonstration and Training				-	-	-	-	-	-			-	
42	PM	C	017900.C.01	1.4.A	Instruction Program	Note 9											
				018113 - Sustainable Design Requirements				-	-	-	-	-	-			-	
43	PM	A	018113.A.01	1.6.D	LEED Documentation Submittals	Note 9											
44	PM	I	018113.I.01	1.7.A	LEED Action Plans	Note 9											
45	PM	I	018113.I.02-*	1.7.B	LEED Progress Reports	Note 9											
				024119 - Selective Demolition				-	-	-	-	-	-			-	
46	ARCH	I	024119.I.01	1.5.A	Schedule of Selective Demolition	Note 4											
47	ARCH	I	024119.I.02	1.5.B	Predemolition Photographs or Video	Note 4											
48	ARCH	C	024119.C.01	1.6.A	Inventory of Removed and Salvaged Items	Note 4											
				031000 - Concrete Forming and Accessories				-	-	-	-	-	-			-	
49	Struct	A	031000.A.01	1.5.A	Product Data	Note 4											
50	Struct	I	031000.I.01	1.6.A	Field Quality Control Reports	Note 4											
				032000 - Concrete Reinforcing				-	-	-	-	-	-			-	
51	Struct	A	032000.A.01	1.3.A	Product Data	Note 4											
52	Struct	A		1.3.B	Shop Drawings	Note 4											
53	Struct	A		1.3.C	Construction Joint Layout	Note 4											
54	Struct	I	032000.I.01	1.4.A	Qualification Statements	Note 4											
55	Struct	I	032000.I.02	1.4.B	Field Quality Control Reports	Note 4											
				033000 - Cast-In-Place Concrete				-	-	-	-	-	-			-	
56	Struct	A	033000.A.01	1.4.A	Product Data	Note 4											
57	Struct	A		1.4.B	Design Mixtures	Note 4											
58	Struct	A		1.4.C	Shop Drawings	Note 4											
59	Struct	I	033000.I.01	1.5.A	Qualification Data	Note 4											
60	Struct	I	033000.I.02	1.5.B	Material Certificates	Note 4											

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Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

Electronic Submittal Required, Unless Noted Otherwise											STATUS CODE						
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61	Struct	I	033000.I.03	1.5.C	Material Test Reports	Note 4											
62	Struct	I	033000.I.04	1.5.D	Field Quality Control Reports	Note 4											
63	Struct	I	033000.I.05	1.5.E	Minutes of Preinstatllation Conference	Note 4											
				042200 - Concrete Unit Masonry				-	-	-	-	-	-			-	
64	Struct	A	042200.A.01	1.4.A	Product Data	Note 4											
65	Struct	A		1.4.B	Sustainable Design Submittals	Note 4											
66	Struct	A		1.4.C	Material Ingredient Screening	Note 4											
67	Struct	A		1.4.D	Shop Drawings	Note 4											
68	Struct	A		1.4.E	Samples for Initial Selection	Note 4											
69	Struct	A		1.4.F	Samples for Verification	Note 4											
70	Struct	I	042200.I.01	1.5.A	Qualification Data	Note 4											
71	Struct	I	042200.I.02	1.5.B	Material Certificates	Note 4											
72	Struct	I	042200.I.03	1.5.C	Mix Designs	Note 4											
73	Struct	I	042200.I.04	1.5.D	Statement of Compressive Strength of Masonry	Note 4											
74	Struct	I	042200.I.05	1.5.E	Cold-Weather [and Hot-Weather] Procedures	Note 4											
				051200 - Structural Steel Framing				-	-	-	-	-	-			-	
75	Struct	A	051200.A.01	1.5.A	Product Data	Note 4											
76	Struct	A		1.5.B	Shop Drawings	Note 4											
77	Struct	A		1.5.C	Welding Procedure Specifications and Procedure Qualification Records	Note 4											
78	Struct	I	051200.I.01	1.6.A	Qualification Data	Note 4											
79	Struct	I	051200.I.02	1.6.B	Welding Certificates	Note 4											
80	Struct	I	051200.I.03	1.6.C	Mill Test Reports	Note 4											
81	Struct	I	051200.I.04	1.6.D	Product Test Reports	Note 4											
82	Struct	I	051200.I.05	1.6.E	Field Quality Control Reports	Note 4											
				055000 - Metal Fabrications				-	-	-	-	-	-			-	
83	Struct	A	055000.A.01	1.3.A	Product Data	Note 4											
84	Struct	A		1.3.B	Shop Drawings	Note 4											
85	Struct	A		1.3.C	Samples for Verification	Note 4											
86	Struct	A		1.3.D	Deligated Design Submittals	Note 4											
87	Struct	A		1.3.E	Sustainable Design Submittals	Note 4											
88	Struct	I	055000.I.01	1.4.A	Mill Certificates	Note 4											
89	Struct	I	055000.I.02	1.4.B	Welding Certificates	Note 4											
90	Struct	I	055000.I.03	1.4.C	Paint Compatibility Certificates	Note 4											
91	Struct	I	055000.I.04	1.4.D	Research Reports	Note 4											
92	Struct	I	055000.I.05	1.4.E	Delegated Design Engineer Qualifications	Note 4											
				055213 - Pipe and Tube Railings				-	-	-	-	-	-			-	
93	Struct	A	055213.A.01	1.3.A	Product Data	Note 4											
94	Struct	A		1.3.B	Sustainable Design Submittals	Note 4											
95	Struct	A		1.3.C	Shop Drawings	Note 4											

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	194300-222814.02	San Luis Obispo County Regional Airport Baggage Screening Modifications	San Luis Obispo County Regional Airport, San Luis Obispo, CA
Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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96	Struct	A	[illegible]	1.3.D	Samples for Initial Selection	Note 4											
97	Struct	A		1.3.E	Samples for Verification	Note 4											
98	Struct	A		1.3.F	Delegated Design Submittal	Note 4											
99	Struct	I	055213.I.01	1.4.A	Qualification Data	Note 4											
100	Struct	I	055213.I.02	1.4.B	Welding Certificates	Note 4											
101	Struct	I	055213.I.03	1.4.C	Mill Certificates	Note 4											
102	Struct	I	055213.I.04	1.4.D	Paint Compatibility Certificates	Note 4											
103	Struct	I	055213.I.05	1.4.E	Product Test Reports	Note 4											
104	Struct	I	055213.I.06	1.4.F	Research Reports	Note 4											
				061000 - Rough Carpentry				-	-	-	-	-	-			-	
105	Struct	A	061000.A.01	1.3.A	Sustainable Design Submittals	Note 4											
106	Struct	I	061000.I.01	1.4.I	Material Certificates	Note 4											
				061600 - Sheathing				-	-	-	-	-	-			-	
107	Struct	A	061600.A.01	1.2.A	Product Data	Note 4											
				072100 - Thermal Insulation				-	-	-	-	-	-			-	
108	Struct	A	072100.A.01	1.2.A	Product Data	Note 4											
				072500 - Weather Barriers				-	-	-	-	-	-			-	
109	Arch	A	072500.A.01	1.2.A	Product Data	Note 4											
				074213.13 - Formed Metal Wall Panels				-	-	-	-	-	-			-	
110	Arch	A	074213.13.A.01	1.2.A	Product Data	Note 4											
111	Arch	A		1.2.B	Shop Drawings	Note 4											
112	Arch	A		1.2.C	Samples for Initial Selection	Note 4											
113	Arch	A		1.2.D	Samples for Verification	Note 4											
				074293 - Soffit Panels				-	-	-	-	-	-			-	
114	Arch	A	074293.A.01	1.3.A	Product Data	Note 4											
115	Arch	A		1.3.B	Shop Drawings	Note 4											
116	Arch	A		1.3.C	Samples for Initial Selection	Note 4											
117	Arch	A		1.3.D	Sample for Verification	Note 4											
118	Arch	I	074293.I.01	1.4.A	Product Test Reports	Note 4											
119	Arch	C	074293.C.01	1.5.A	Maintenance Data	Note 4											
				076100 - Sheet Metal Roofing				-	-	-	-	-	-			-	
120	Arch	A	076100.A.01	1.3.A	Product Data	Note 4											
121	Arch	A		1.3.B	Shop Drawings	Note 4											
122	Arch	A		1.3.C	Samples for Initial Selection	Note 4											
123	Arch	A		1.3.D	Samples for Verification	Note 4											
124	Arch	I	076100.I.01	1.4.A	Coordination Drawings	Note 4											
125	Arch	I	076100.I.02	1.4.B	Samples Warranties	Note 4											
126	Arch	C	076100.C.01	1.5.A	Maintenance Data	Note 4											
127	Arch	C	076100.C.02	1.5.B	Special Warranties	Note 4											

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	194300-222814.02	**San Luis Obispo County Regional Airport Baggage Screening Modifications**	**San Luis Obispo County Regional Airport, San Luis Obispo, CA**
Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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				076200 - Sheet Metal Flashing and Trim				-	-	-	-	-	-			-	
128	Arch	A	076200.A.01	1.3.A	Product Data	Note 4											
129	Arch	A		1.3.B	Shop Drawings	Note 4											
130	Arch	A		1.3.C	Samples	Note 4											
131	Arch	A		1.3.D	Samples for Initial Selection	Note 4											
				078413 - Penetration Firestopping				-	-	-	-	-	-			-	
132	Arch	A	078413.A.01	1.2.A	Product Data	Note 4											
133	Arch	A		1.2.B	Product Schedule	Note 4											
134	Arch	I	078413.I.01	1.3.A	Qualification Data	Note 4											
135	Arch	I	078413.I.02	1.3.B	Listed System Designs	Note 4											
136	Arch	C	078413.C.01	1.4.A	Installer Certificates	Note 4											
				079200 - Joint Sealants				-	-	-	-	-	-			-	
137	Arch	A	079200.A.01	1.2.A	Product Data	Note 4											
138	Arch	I	079200.I.01	1.3.A	Sample Warranties	Note 4											
				081113 - Hollow Metal Doors and Frames				-	-	-	-	-	-			-	
139	Arch	A	081113.A.01	1.5.A	Product Data	Note 4											
140	Arch	A		1.5.B	Shop Drawings	Note 4											
141	Arch	I	081113.I.01	1.6.A	Product Test Reports	Note 4											
				092900 - Gypsum Board				-	-	-	-	-	-			-	
142	Arch	A	092900.A.01	1.3.A	Product Data	Note 4											
				099113 - Exterior Paining				-	-	-	-	-	-			-	
143	Arch	A	099113.A.01	1.3.A	Product Data	Note 4											
144	Arch	A		1.3.B	Samples for Initial Selection	Note 4											
				099123 - Interior Paining				-	-	-	-	-	-			-	
145	Arch	A	099123.A.01	1.2.A	Product Data	Note 4											
146	Arch	A		1.2.B	Samples	Note 4											
147	Arch	A		1.2.C	Product Schedule	Note 4											
				099600 - High-Performance Coatings				-	-	-	-	-	-			-	
148	Arch	A	099600.A.01	1.3.A	Product Data	Note 4											
149	Arch	A		1.3.B	Samples for Initial Selection	Note 4											
150	Arch	A		1.3.C	Samples for Verification	Note 4											
				133123 - Tensile Membrane Structures				-	-	-	-	-	-			-	
151	Arch	A	133123.A.01	1.5.A	General	Note 4											
152	Arch	A		1.5.B	Qualification Data	Note 4											
153	Arch	A		1.5.C	Delegated-Design Submittal	Note 4											
154	Arch	A		1.5.D	Product Data	Note 4											
155	Arch	A		1.5.E	Shop Drawings	Note 4											
156	Arch	A		1.5.F	Quality Assurance Submittals	Note 4											
157	Arch	A		1.5.G	Manufacturer's Installation Instructions	Note 4											

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	194300-222814.02	San Luis Obispo County Regional Airport Baggage Screening Modifications	San Luis Obispo County Regional Airport, San Luis Obispo, CA
Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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158	Arch	C	133123.C.01	1.6.A	Warranty	Note 4											
159	Arch	C	133123.C.02	1.6.B	Record Documents	Note 4											
160	Arch	C	133123.C.03	1.6.C	Maintenance Manual	Note 4											
				210500 - Common Work Results for Fire Suppression				-	-	-	-	-	-			-	
161	FP	A	210500.A.01	1.2.A	Product Data	Note 4											
162	FP	I	210500.I.01	1.3.A	Field Quality Control Reports	Note 4											
				210553 - Identification for Fire-Suppression Piping and Equipment				-	-	-	-	-	-			-	
163	FP	A	210553.A.01	1.2.A	Product Data	Note 4											
164	FP	A		1.2.B	Samples	Note 4											
165	FP	A		1.2.C	Equipment Label Schedule	Note 4											
166	FP	A		1.2.D	Valve-Numbering Scheme	Note 4											
167	FP	A		1.2.E	Valve Schedules	Note 4											
				211100 - Facility Fire Suppression Water Service Piping				-	-	-	-	-	-			-	
168	FP	A	211100.A.01	1.4.A	Product Data	Note 4											
169	FP	A		1.4.B	Delegated-Design Submittals	Note 4											
170	FP	A		1.4.C	Proof of Plan Approval by AHJ	Note 4											
171	FP	A		1.4.D	Completed Certificate Contained in NFPA 24	Note 4											
172	FP	A		1.4.E	Record Drawings	Note 4											
173	FP	A		1.4.F	Submittals Shall be Delivered Prior to Proposed Scheduled	Note 4											
				219000 - Water Based Fire Suppression Systems				-	-	-	-	-	-			-	
174	FP	A	219000.A.01	1.4.A	Delegated-Design Submittals	Note 4											
175	FP	A		1.4.B	Submittal Disposition	Note 4											
176	FP	I	219000.I.01	1.5 A	Constractor's Qualifications	Note 4											
177	FP	C	219000.C.01	1.6.A	Operations and Maintenance Manual	Note 4											
178	FP	C	219000.C.02	1.6.B	Record Drawings, Calculations, and Acceptance Test Certificates	Note 4											
				230593 - Testing, Adjusting and Balancing for HVAC				-	-	-	-	-	-			-	
179	Mech	A	230593.A.01	1.4.A	Qualification Data	Note 4											
180	Mech	A		1.4.B	Contract Documents Examination Report	Note 4											
181	Mech	I	230593.I.01	1.5.A	Strategies and Procedures Plan	Note 4											
182	Mech	I	230593.I.02	1.5.B	Certified TAB Reports	Note 4											
183	Mech	I	230593.I.03	1.5.C	Sample Report Forms	Note 4											
184	Mech	I	230593.I.04	1.5.D	Instrument Calibration Reports	Note 4											
				230700 - HVAC Insulation				-	-	-	-	-	-			-	
185	Mech	A	230700.A.01	1.2.A	Qualification Data	Note 4											
186	Mech	I	230700.I.01	1.3.A	Field Quality Control Reports	Note 4											
				230800 - Commissioning of HVAC				-	-	-	-	-	-			-	
187	Mech	I	230800.I.01	1.9.A	Certificates of Readiness	Note 4											
188	Mech	I	230800.I.02	1.9.B	Certificates of Completion of Installation, Prestart, & Startup Activities	Note 4											
				233300 - Air Ducts Accessories				-	-	-	-	-	-			-	

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	194300-222814.02	**San Luis Obispo County Regional Airport Baggage Screening Modifications**	**San Luis Obispo County Regional Airport, San Luis Obispo, CA**
Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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189	Mech	A	233300.A.01	1.1.A	Product Data	Note 4											
190	Mech	C	233300.C.01	1.2.A	Operation and Maintenance Data	Note 4											
				233713 - Diffusers, Registers and Grills				-	-	-	-	-	-			-	
191	Mech	A	233713.A.01	1.1.A	Product Data	Note 4											
				237413 - Packaged, Outdoor, Central-Station Air-Handling Units				-	-	-	-	-	-			-	
192	Mech	A	237413.A.01	1.3.A	Product Data	Note 4											
193	Mech	A		1.3.B	Shop Drawings	Note 4											
194	Mech	I	237413.I.01	1.4.A	Field Quality Control Test Reports	Note 4											
195	Mech	C	237413.C.01	1.5.A	Operation and Maintenance Data	Note 4											
196	Mech	C	237413.C.02	1.5.B	Warranty	Note 4											
				260500 - Common Work Results for Electrical				-	-	-	-	-	-			-	
197	Elec	A	260500.A.01	1.10.A	Submit for all Equipment and Systems	Note 4											
198	Elec	A		1.10.B	Delegated-Design Submittal	Note 4											
199	Elec	A		1.10.C	Manufacturer Seismic Qualification Certification	Note 4											
				260519 - Low Voltage Electrical Power Conductors and Cables				-	-	-	-	-	-			-	
200	Elec	A	260519.A.01	1.2.A	Product Data	Note 4											
201	Elec	I	260519.I.01	1.3.A	Qualification Data	Note 4											
202	Elec	I	260519.I.02	1.3.B	Field Quality Control Reports	Note 4											
				260526 - Grounding and Bonding for Electrical Systems				-	-	-	-	-	-			-	
203	Elec	A	260526.A.01	1.2.A	Product Data	Note 4											
204	Elec	I	260526.I.01	1.3.A	As-Built Data	Note 4											
205	Elec	I	260526.I.02	1.3.B	Qualification Data	Note 4											
206	Elec	I	260526.I.03	1.4.C	Field Quality Control Reports	Note 4											
207	Elec	C	260526.C.01	1.5.A	Operation and Maintenance Data	Note 4											
				260529 - Hangers and Supports for Electrical Systems				-	-	-	-	-	-			-	
208	Elec	I	260529.I.01	1.4.A	Welding Certificates	Note 4											
				260533 - Raceways and Boxes for Electrical Systems				-	-	-	-	-	-			-	
209	Elec	A	260533.A.01	1.3.A	Product Data	Note 4											
210	Elec	A		1.3.A	Sustainable Design Submittals	Note 4											
211	Elec	A		1.3.B	Shop Drawings	Note 4											
212	Elec	I	260533.I.01	1.4.A	Coordination Drawings	Note 4											
213	Elec	I	260533.I.02	1.4.B	Qualification Data	Note 4											
214	Elec	I	260533.I.03	1.4.C	Seismic Qualification Data	Note 4											
215	Elec	I	260533.I.04	1.4.D	Source Quality-Control Reports	Note 4											
				260543 - Underground Ducts and Raceways for Electrical Systems				-	-	-	-	-	-			-	
216	Elec	A	260543.A.01	1.4.A	Shop Drawings	Note 4											
				260548.16 - Seismic Controls for Electrical Systems				-	-	-	-	-	-			-	
217	Elec	A	260548.16.A.01	1.3.A	Product Data	Note 4											
218	Elec	A		1.3.B	Deligated-Design Submittal	Note 4											

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	194300-222814.02	**San Luis Obispo County Regional Airport Baggage Screening Modifications**	**San Luis Obispo County Regional Airport, San Luis Obispo, CA**
Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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219	Elec	A	[illegible]	1.3.C	Qualification Data	Note 4											
220	Elec	A		1.3.D	Field Quality-Control Reports	Note 4											
				260553 - Identification for Electrical Systems				-	-	-	-	-	-			-	
221	Elec	A	260553.A.01	1.3.A	Product Data	Note 4											
222	Elec	A		1.3.B	Identification Schedule	Note 4											
				260574 - Overcurrent Protective Device ARC-Flash Study				-	-	-	-	-	-			-	
223	Elec	A	260574.A.01	1.4.A	Product Data	Note 4											
224	Elec	A		1.4.B	Study Submittals	Note 4											
225	Elec	I	260574.I.01	1.5.A	Qualification Data	Note 4											
226	Elec	I	260574.I.02	1.5.B	Product Certificates	Note 4											
227	Elec	C	260574.C.01	1.6.A	Operation and Maintenance Data	Note 4											
				260913 - Electrical Power Monitoring and Control				-	-	-	-	-	-			-	
228	Elec	A	260913.A.01	1.2.A	Product Data	Note 4											
229	Elec	A		1.2.B	Shop Drawings	Note 4											
230	Elec	I	260913.I.01	1.3.A	Qualification Data	Note 4											
231	Elec	I	260913.I.02	1.3.B	Field Quality-Control Reports	Note 4											
232	Elec	I	260913.I.03	1.3.C	Other Informational Submittals	Note 4											
233	Elec	C	260913.C.01	1.4.A	Operation and Maintenance Data	Note 4											
234	Elec	C	260913.C.02	1.4.B	Software and Firmware Operational Documentation	Note 4											
235	Elec	C	260913.C.03	1.4.C	Software Licences and Upgrades	Note 4											
				260923 - Lighting Control Devices				-	-	-	-	-	-			-	
236	Elec	A	260923.A.01	1.3.A	Product Data	Note 4											
237	Elec	A		1.3.B	Shop Drawings	Note 4											
238	Elec	I	260923.I.03	1.3.A	Sample Warranty - for Special Warranty	Note 4											
239	Elec	C	260923.C.01	1.4.A	Operation and Maintenance Data	Note 4											
240	Elec	C	260923.C.02	1.4.B	Energy Efficient Rebate Forms	Note 4											
				260943 - Distrubuted Lighting Controls				-	-	-	-	-	-			-	
241	Elec	A	260943.A.01	1.7.A	Product Data	Note 4											
242	Elec	A		1.7.B	Occupancy Sensor Shop Drawings	Note 4											
243	Elec	I	260943.I.01	1.8.A	Coordination Drawings	Note 4											
244	Elec	I	260943.I.02	1.8.B	Qualification Data	Note 4											
245	Elec	I	260943.I.03	1.8.C	Field Quality-Control Reports	Note 4											
246	Elec	I	260943.I.04	1.8.D	Software Licences and Upgrades	Note 4											
247	Elec	I	260943.I.05	1.8.E	Sample Warranty	Note 4											
248	Elec	C	260943.C.01	1.9.A	Operation and Maintenance Data	Note 4											
249	Elec	C	260943.C.02	1.9.B	Software and Firmware Operational Documentation	Note 4											
				262213 - Low Voltage Distribution Transformers				-	-	-	-	-	-			-	
250	Elec	A	262213.A.01	1.3.A	Product Data	Note 4											
251	Elec	A		1.3.B	Shop Drawings	Note 4											

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Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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252	Elec	I	262213.I.01	1.4.A	Qualification Data	Note 4											
253	Elec	I	262213.I.02	1.4.B	Seismic Qualification Data	Note 4											
254	Elec	I	262213.I.03	1.4.C	Source Quality-Control Reports	Note 4											
255	Elec	I	262213.I.04	1.4.D	Field Quality-Control Reports	Note 4											
256	Elec	C	262213.C.01	1.4.A	Operation and Maintenance Data	Note 4											
				262416 - Panelboards				-	-	-	-	-	-			-	
257	Elec	A	262416.A.01	1.3.A	Product Data	Note 4											
258	Elec	A		1.3.B	Shop Drawings	Note 4											
259	Elec	I	262416.I.01	1.4.A	Qualification Data	Note 4											
260	Elec	I	262416.I.02	1.4.B	Seismic Qualification Data	Note 4											
261	Elec	I	262416.I.03	1.4.C	Panelboard Schedules	Note 4											
262	Elec	C	262416.C.01	1.5.A	Operation and Maintenance Data	Note 4											
				262726 - Wiring Devices		Note 4		-	-	-	-	-	-			-	
263	Elec	A	262726.A.01	1.3.A	Product Data	Note 4											
264	Elec	A		1.3.B	Shop Drawings	Note 4											
265	Elec	C	262726.C.01	1.4.A	Operation and Maintenance Data	Note 4											
				264313 - Surge Protection for Low Voltage Electrical Power Circuits				-	-	-	-	-	-			-	
266	Elec	A	264313.A.01	1.3.A	Product Data	Note 4											
267	Elec	I	264313.I.01	1.4.A	Field Quality-Control Reports	Note 4											
268	Elec	I	264313.I.02	1.4.B	Sample Warranty	Note 4											
269	Elec	C	264313.C.03	1.5.A	Maintenance Data	Note 4											
				265100 - Interior Lighting				-	-	-	-	-	-			-	
270	Elec	A	265100.A.01	1.3.A	Product Data	Note 4											
271	Elec	A		1.3.B	Installation instructions	Note 4											
272	Elec	C	265100.C.01	1.4.A	Operation and Maintenance Data	Note 4											
				270526 - Grounding and Bonding for Communications Systems				-	-	-	-	-	-			-	
273	Elec	A	270526.A.01	1.4.A	Product Data	Note 4											
274	Elec	A		1.4.B	Shop Drawings	Note 4											
275	Elec	I	270526.I.01	1.5.A	As-Built Data	Note 4											
276	Elec	I	270526.I.02	1.5.B	Qualification Data - For Installation Company	Note 4											
277	Elec	I	270526.I.03	1.5.C	Qualification Data - For Testing Agency	Note 4											
278	Elec	I	270526.I.04	1.5.D	Field Quality-Control Reports	Note 4											
279	Elec	C	270526.C.01	1.6.A	Operation and Maintenance Data	Note 4											
				270528 - Pathways for Communication Systems				-	-	-	-	-	-			-	
280	Tech	A	270528.A.01	1.2.A	Product Data	Note 4											
281	Tech	I	270528.I.01	1.3.A	Manufacturers' Published Instructions Submittals	Note 4											
				270527 - Hangers and Supports for Communications Systems				-	-	-	-	-	-			-	
282	Tech	A	270527.A.01	1.2.A	Product Data	Note 4											
283	Tech	A		1.2.B	Shop Drawings	Note 4											

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Construct a tensioned fabric structure for relocated baggage screening. Renovate existing baggage screening area in terminal building as needed to expand adjacent facilities.	1. Pre-Construction Meeting 2. As Required 3. See Specification Section	4. NLT than +15 business days of required approval 5. NLT than +10 business days of site delivery 6. NLT than +10 business days of commencement of work	7. NLT than +15 business days of commencement of work 8. NLT than +5 business days of inspection 9. NLT than +2 business of Pre-Final Inspection

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284	Tech	A		1.2.C	Delegated-Design Submittals	Note 4											
285	Tech	I	270527.I.01	1.3.A	Coordination Drawings	Note 4											
286	Tech	I	270527.I.02	1.3.B	Welding Certificates	Note 4											
287	Tech	I	270527.I.03	1.3.C	Seismic Qualification Data	Note 4											
				270536 - Cable Trays for Communications Systems				-	-	-	-	-	-			-	
288	Tech	A	270536.A.01	1.3.A	Product Data	Note 4											
289	Tech	A		1.3.B	Shop Drawings	Note 4											
290	Tech	I	270536.I.01	1.4.A	Coordination Drawings	Note 4											
291	Tech	I	270536.I.02	1.4.B	Seismic Qualification Data	Note 4											
292	Tech	I	270536.I.03	1.4.C	Field Quality-Control Reports	Note 4											
				270544 - Sleeves and Sleeve Seals for Communications Pathways and Cabling				-	-	-	-	-	-			-	
293	Tech	A	270544.A.01	1.3.A	Product Data	Note 4											
				270548.16 - Seismic Controls for Communications Systems				-	-	-	-	-	-			-	
294	Tech	A	270548.16.A.01	1.3.A	Product Data	Note 4											
295	Tech	A		1.3.B	Deligated-Design Submittal	Note 4											
296	Tech	A		1.3.C	Seismic and Wind-Restraint Details	Note 4											
294	Tech	I	270548.16.I.01	1.4.A	Coordination Drawings	Note 4											
295	Tech	I	270548.16.I.02	1.4.B	Qualification Data	Note 4											
296	Tech	I	270548.16.I.03	1.4.C	Welding Certificates	Note 4											
297	Tech	I	270548.16.I.04	1.4.D	Field Quality Control Reports	Note 4											
				270553 - Identification for Communications Systems				-	-	-	-	-	-			-	
298	Tech	A	270553.A.01	1.3.A	Product Data	Note 4											
299	Tech	A		1.3.B	Samples	Note 4											
299	Tech	A		1.3.C	Identification Schedule	Note 4											
				271513 - Communications Copper Horizontal Cabling				-	-	-	-	-	-			-	
300	Tech	A	271513.A.01	1.5.A	Product Data	Note 4											
301	Tech	A		1.5.B	Shop Drawings	Note 4											
302	Tech	A		1.5.C	Twisted Pair Cable Testing Plan	Note 4											
303	Tech	I	271513.I.01	1.6.A	Qualification Data	Note 4											
304	Tech	I	271513.I.02	1.6.B	Product Certificates	Note 4											
305	Tech	I	271513.I.03	1.6.C	Source Quality Control Reports	Note 4											
306	Tech	I	271513.I.04	1.6.D	Field Quality Control Reports	Note 4											
307	Tech	C	271513.C.01	1.7.A	Maintenance Data	Note 4											
308	Tech	C	271513.C.02	1.7.B	Record Drawings	Note 4											
				281500 - Access Control Hardware Devices				-	-	-	-	-	-			-	
309	Tech	A	280500.A.01	1.4.A	Product Data	Note 4											
310	Tech	A		1.4.B	Shop Drawings	Note 4											
311	Tech	A		1.4.C	Product Schedules	Note 4											
312	Tech	I	281500.I.01	1.5.A	Field Quality Control Reports	Note 4											

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313	Tech	C	281500.C.01	1.6.A	Operation and Maintenance Data	Note 4											
				282000 - Video Surveillance				-	-	-	-	-	-			-	
314	Tech	A	282000.A.01	1.4.A	Product Data	Note 4											
315	Tech	A		1.4.B	Shop Drawings	Note 4											
316	Tech	A		1.4.C	Design Data	Note 4											
317	Tech	I	282000.I.01	1.5.A	Seismic Qualification Data	Note 4											
318	Tech	I	282000.I.02	1.5.B	Field Quality Control Reports	Note 4											
319	Tech	C	282000.C.01	1.6.A	Operation and Maintenance Data	Note 4											
				283100 - Fire Detection and Alarm				-	-	-	-	-	-			-	
320	Tech	A	283100.A.01	1.4.A	Delegateed-Design Submittals	Note 4											
321	Tech	A		1.4.B	Submittal Disposition	Note 4											
322	Tech	I	283100.I.01	1.5.A	Contractor's Qualifications	Note 4											
323	Tech	I	283100.I.02	1.5.B	Fire Alarm System Designer	Note 4											
324	Tech	C	283100.C.01	1.6.A	Operations and Maintenance Manual	Note 4											
325	Tech	C	283100.C.02	1.6.B	Record Drawings and Acceptance Test Certificates	Note 4											
				321216 - Asphalt Paving				-	-	-	-	-	-			-	
326	Civil	A	321216.A.01	1.4.A	Hot-Mix Asphalt Designs	Note 4											
327	Civil	I	321216.I.01	1.5.A	Material Certificates	Note 4											
				321723 - Pavement Markings				-	-	-	-	-	-			-	
328	Civil	A	321723.A.01	1.3.A	Product Data	Note 4											
329	Civil	A	321723.A.02	1.3.B	Shop Drawings	Note 4											
330	Civil	A	321723.A.03	1.3.C	Samples	Note 4											

SECTION 013513 – SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Guidelines and requirements for:

a. Operational safety on and at airports during construction.
b. Foreign Object Debris Management
c. Health and Safety procedures during construction
d. Work Site Decorum

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.4 ACTION SUBMITTALS

A. Construction Safety and Phasing Plan (CSPP)

1.5 INFORMATIONAL SUBMITTALS

A. Safety Plan Compliance Document (SPCD):

1.6 OPERATIONAL SAFETY ON AND AT AIRPORTS DURING CONSTRUCTION.

A. Construction Safety and Phasing Plan.

1. The initial Construction Safety and Phasing Plan developed for this project is provided in the G-series sheets. The documents are to be used as parameters and operational requirements, the contractor is responsible for gaining an approved Construction Safety and Phasing Plan that includes:

a. The schedule
b. Phasing of all work
c. Phased site plans and floorplans.

B. SAFETY PLAN COMPLIANCE DOCUMENT

1. Submit a SPCD to the Airport Director of Engineering describing how it will comply with the requirements of the Construction Safety and Phasing Plan (CSPP) and supplying any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor that indicates it understands the operational safety requirements of the CSPP and it asserts it will not deviate from the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re- coordination with the airport operator and the Federal Aviation Administration (FAA) in advance.
2. The SPCD should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award.
3. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I , *Name of Contractor* , have read the *Title of Project CSPP*, approved on *Date*, and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "*No supplemental information*," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP.

C. Have available at all times copies of the CSPP and SPCD for reference by the airport and its representatives, and by subcontractors and contractor employees.

D. Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage. Coordinate with the Health and Safety procedures below.

E. Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site whenever active construction is taking place.

1. Conduct inspections in sufficient frequency to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
2. Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate and as specified in the CSPP and SPCD.
3. Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.
4. Prior to being allowed any access to the Aircraft Operations Area or Aircraft Movement Area, the Contractor shall prepare, submit and receive approval of a Safety Plan Compliance Document.
5. Coordination: Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.

6. Phasing: Discuss proposed construction schedule elements, including:

    a. Duration of each phase.
    b. Daily start and finish of construction, including "night only" construction.

7. Areas and operations affected by the construction activity: These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.

8. Contractor access: Provide the following:

    a. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).

    b. Listing of individuals requiring driver training (for certificated airports and as requested).
    c. Radio communications.
    d. Types of radios and backup capabilities.

        1) Who will be monitoring radios.
        2) Whom to contact if the air traffic control tower (ATCT) cannot reach the contractor's designated person by radio.

    e. Details on how the contractor will escort material delivery vehicles.

9. Foreign Object Debris (FOD) Management: Discuss equipment and methods for control of FOD, including construction debris and dust.

10. Hazardous Material (HAZMAT) Management: Discuss methods for responding to discovery of hazardous materials.
11. Notification of Construction Activities: Provide the following:

    a. Contractor points of contact: Primary and Secondary.

    b. Contractor emergency contact: 24-hour.

12. Inspection Requirements: Discuss daily (or more frequent) inspections and special inspection procedures.

13. Underground Utilities: Discuss proposed methods of identifying and protecting underground utilities.
14. Penalties: Penalties should be identified in the CSPP and should not require an entry in the SPCD.
15. Marking and Signs for Access Routes: Discuss proposed methods of demarcating access routes for vehicle drivers.
16. Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.
17. Record Keeping & Close-out: Contractor shall maintain a log of all inspections, meeting minutes, drawings and other relevant data. Records shall be well organized and maintained in notebook style on site. Records shall be accessible to the owner for

review at all times. A copy of the SPCD and associated documents shall be submitted along with project close-out documentation.

1.7 CONTRACTOR ACCESS

A. Vehicle and Pedestrian Operations.

1. Contractor's Employee Parking.

a. No parking of contractor personal vehicles (POV) within the Secure Area/ Air Operations Area (airside).
b. See contractor's POV parking on CSPP drawings.

2. Contractor construction vehicle parking.

a. Contractor construction vehicles required to be on airfield side of the terminal shall be limited to five vehicles for the prime contractor and all subcontractors. See G-series sheets for contractor vehicle parking area.

B. Construction Site Entrance Locations.

1. Contractor's personnel that park in the contractor's POV parking lot shall enter the terminal at Baggage Claim on the concourse level.

2. Contractor construction vehicle access shall be via Vehicle Gate 10. See G-series sheets for Vehicle Gate 10 location.
3. Contractor shall provide and maintain security. If contractor hires a security firm at any time during the project or for the duration of site use. These requirements will apply:

a. All security personnel that will be controlling airfield access are required to attend a security workshop conducted by the airport operator.

1) Guard responsibilities include, but are not limited to:

a) Guards shall not be armed.
b) Guards shall be equipped with operational cell phones.
c) A minimum of two guards shall be stationed at each gate being utilized by the contractor (existing gates and temporary construction gates).
d) Guards shall inspect all contractor vehicles.
e) Guards shall inspect all badges and vehicle placards and maintain a log of all vehicles entering and leaving.

b. All security personnel that will be controlling secure sterile building access are required to attend a security workshop conducted by the airport operator.

1) Guard responsibilities include, but are not limited to:

a) Guards shall not be armed.
b) Guards shall be equipped with operational cell phones.

c) A minimum of one guard shall be stationed at each location being utilized by the contractor (existing gates and temporary construction gates).
d) Guards shall challenge and follow all SIDA rules.

C. Lighting of Contractor Construction Vehicles

1. Contractor vehicles, not escorted, shall be equipped per airport and TSA standards comply with all requirements: This may include:

a. A flashing light that is mounted on the uppermost part of the vehicle.
b. Lights shall be flashing yellow and visible from any direction, day and night, including from the air. Lights must have a peak intensity within the range of 40-400 candelas (effective) from 0 degrees horizontal up to 10 degrees above horizontal and for 360 degrees horizontal. The upper limit of 400 candelas (effective) is necessary to avoid damage to night vision.
c. From 10 degrees to 15 degrees above the horizontal plane, the light output must be 1/10th of peak intensity or between 4 and 40 candelas (effective).
d. Lights must flash at 75 +/- 15 flashes per minute.

D. Vehicle Speed

1. Motor vehicles shall not operate at a speed that endangers property or persons in the area.
2. Motor vehicles shall not exceed 10 mph on the aircraft parking ramps or 25 mph on the perimeter/service roads. All vehicles are restricted to 5 mph when in close proximity to aircraft.

E. Involvement in Vehicle Accidents.

1. Any persons damaging any airfield light fixture or other airport facility shall report such damage to the Airport Manager’s office immediately and shall be responsible for his or her share of any costs required to repair or replace damaged fixtures or facility.

F. Description of proper vehicle operations

1. Proper vehicle operations shall be adhered to at all times and consistent with instruction provided by owner during an on-site Driver's Training briefing. See “Training Requirements for Vehicle Drivers” Article below.

2. Vehicles within the secure area may only be operated by persons having successfully completed Non-Movement Area Driver Training or be escorted by a person having successfully completed Non-Movement Area Driver Training.

G. Training Requirements for Vehicle Drivers

1. Contractor’s personnel and all subcontractors’ personnel that have successfully completed SIDA badging and that will be operating a vehicle or equipment within the secure area shall complete a Non-Movement Area Driver Training class and pass a

written exam. Applicants must possess a valid driver's license and a SIDA Badge in order to participate in Non-Movement Area Driver Training.

H. Required escorts.

1. All drivers requiring access to the secure area, that do not have driver training, shall be escorted by a person that have successfully completed Non-Movement Area Driver Training, that are currently badged and permitted accordingly.

2. All drivers requiring access to Movement Areas that do not have Movement Area training shall be escorted by a person that has successfully completed Movement Area Driver Training and are currently badged and permitted accordingly.

I. Situational awareness.

1. Contractor's personnel shall constantly monitor their surroundings. Contractor must confirm by personal observation that no aircraft is approaching their position even when the airfield is closed.

2. Vehicle drivers must confirm by personal observation that no aircraft is approaching their position during operation in the Non-Movement Area. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time.

1.8 FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

A. Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project.

1. Vehicle Cleanliness & Security: All contractors shall keep vehicle contents and payload secure at all times to prevent migration of materials onto airfield pavements.
2. Pavement Sweeping/Vacuuming: Contractor shall maintain by sweeping and vacuuming or other approved means, all pavements impacted by contractor operations, including, but not limited to haul route pavements and pavement adjacent to the area of work. Pavements shall be kept free of construction materials, dirt, rocks and other debris at all times for the life of the project by vacuuming operations during all working hours. Contractor shall vacuum all pavements utilized/impacted by contractor operations at the end of each work shift. At the completion of the construction and prior to final acceptance, the contractor shall conduct a final vacuuming of all pavements utilized/impacted by contractor operations. Steel wire broom vehicles are not permitted.
3. FOD Fence: Not applicable.
4. Inspections: Not applicable.
5. Inspection of FOD procedures and effectiveness shall be part of all inspections.

1.9 HEALTH AND SAFETY PROCEDURES DURING CONSTRUCTION

A. Site Safety:

1. General Contractor to include in the SPCD a training program for all participants that will be using the construction site.

    a. The training should be documented and trackable.
    b. Each trainee should have an identifier issued to them indicating that they have completed the training. Contractor option: to require the identifier to be visible to indicate safety training has been completed, i.e. sticker on the helmet.
    c. Each trainee should acknowledge they understand the training requirements.

B. Infectious Disease:

1. General Contractor to provide plan and program to control the spread of any prevalent infectious disease, regional widespread epidemic, or global pandemic.

    a. Plan, process, and program will include procedures for all site construction personnel.

        1) At a minimum,

            a) Contractor should perform daily screenings of symptoms and exposures.
            b) Contractors and all employees to maintain 6' of distance when meeting in person.

    b. Provide contractor check-in procedures that allow for remote check-in and promote limited or no job trailer access.
    c. Provide means to connect trades and other groups to perform group meetings remotely, wirelessly, or with onsite teleconferences. (i.e. Daily toolbox, safety, huddle, field-crew, check-ins, briefing, progress, and superintendent meetings)
    d. Provide for off-site teleconferences.
    e. Provide handwashing stations to allow for adequate hygiene.
    f. Training may be required similar to the Site Safety.
    g. Confirm with Owner, the level of plan and procedures needed. This may be implemented at commencement of the work or at any time during the contract, at the sole discretion of the Owner.

1.10 WORK SITE DECORUM

A. All noise restrictions apply during 5:00am - 10:00pm and noise related activities should be scheduled outside of these hours unless otherwise allowed and depending on the specific circumstances, some activities may take place during regular working hours at the Owners sole discretion.

1. Noise: May include, if available, individually outlined noise restrictions for certain materials. Extreme care shall be given to the level of Noise in and around the terminal building. Extreme care to limit noise shall be taken always. Loud or unnecessary conversation shall be avoided. The playing of radios, audio devices shall be strictly prohibited. Noise, that in the sole opinion of the Owner is disturbing or disruptive to occupants adjacent to the area of work, shall be scheduled for periods when the

building is not occupied or other measures that the Owner sees fit will be implemented on a as needed basis.

B. Contract and all contractor related staff and employee Conduct: Control the conduct of its employees to prevent unwanted interaction initiated by Contractor's employees with Airport occupants, staff, or other individuals, adjacent to the Project site. Without limitation, unwanted interaction by Contractor's employees includes whistling at or initiating conversations with passersby. If any Contractor's employee initiates such unwanted interaction, or utilizes profanity, Contractor shall, either upon request of the Owner or on its own initiative, replace said employee with another of equivalent technical skill, at no additional cost to the Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013513

SECTION 013573 - DELEGATED DESIGN PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Procedures for Delegated Design coordination.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Review Divisions 02 through 48 for specific sections indicating portions of the work are delegated to a licensed professional using the term Delegated Design.

C. Review Contract Drawings for delegated design and delegated design submittals required therein.

1. See Drawing S-002 and related specification sections for structural delegated design items.

1.4 PARTICIPANTS AND ROLES

A. Contractor: The Awarded General (Prime) Contractor responsible for the day-to-day oversight of a construction site, management of vendors and trades, and the communication of information to all involved parties throughout the course of construction of this project as required by the documents.

B. Contractor-Hired Design Professional or Contractor’s Licensed Design Professional: For the majority of the documents this is referred to as the Delegated Designer.

C. Delegated Designer: A Contractor-Hired Design Professional who meets the qualifications as indicated in the specific section and is licensed to practice the scope of work being described as a Delegated Design.

D. Design Professional or Owner-Hired Design Professional: The Architect and Engineers of Record hired by the Owner. Sometimes referred to as the Design Team, or Design Professionals.

1. Where the Contract Documents specifically require the Contractor to provide professional design services or certifications by a design professional related to systems, materials, or equipment, the Architect will specify the appropriate performance and design criteria that such services must satisfy. The Architect will review and take appropriate action on Shop Drawings and other submittals related to the Work designed or certified by the Contractor's Design Professional.
2. Contractor's Design Professional submittals shall bear such professional's seal and signature when submitted to the Architect. The Architect's review shall be for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect shall be entitled to rely upon, and shall not be responsible for, the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals.

E. Owner: Means the entity of authority representing the building(s) and property and holds the title to the facilities. For the purposes of this Regulation an owner may designate an agent that is the person responsible for making final decisions.

1.5 DEFINITIONS

A. DELEGATED DESIGN: A portion of the Work in the Contract Documents that specifically require the Contractor to provide professional design services or certifications by a licensed, registered design professional related to systems, materials, or equipment. This Contractor-Hired Designer applies its seal and signature to the drawings, specifications, calculations, and reports it prepared for the assigned portion of the Work as specified in the documents. This is process is indicated by the words "Delegated design."

B. DELEGATED DESIGN SUBMITTAL(S): At each Delegated Design, Provide two subtypes of submittals:

1. Delegated Design Submittals: They include design drawings, design specifications, calculations, and reports: these are the contractor-hired designer's "instruments of service"—the representation of the delegated, final design.

    a. Provide Action Submittals as indicated.

2. Delegated Construction Submittals: Shop drawings, product data, and certifications. These are the traditional construction submittals, albeit for the delegated design work done by the contractor hired design professional.

    a. Provide Informational Submittals as indicated.

1.6 ACTION SUBMITTALS

A. Qualifications of the Contractor-Hired Design Professional.

1. Submit qualifications per the documents for each section.
2. At a minimum, provide Licensed information on the Contractor-Hired Design Professional.

B. Delegated Design Submittals: All of which must include approval stamp of both the contractor and the Contractor-Hired designer.

1. Submit through Section 013300 – Submittal Requirements
2. Owner-Hired Design Professional will review these only for limited purposes, to verify:

a. The submittal generally covers the scope of the delegated design work as indicated in the contract documents.
b. The design is in compliance with the applicable performance and design criteria stated in the contract documents.
c. The delegated design is consistent with the design professional's overall intent for the final project as a functioning whole.

1.7 INFORMATIONAL SUBMITTALS

A. Delegated Construction Submittals: All of which must include approval stamp of both the contractor and the Contractor-Hired designer. The Owner-Hired Design Professional will record the submittal for record to the Owner and review for major contradictions that might affect other work or overall intent. Not an Action submittal, but for information only.

1. Submit through Section 013300 – Submittal Requirements, with the exception that the Owner-Hired Design Professional will not take action on informational submittals that do not include an approval stamp of both the contractor and the Contractor-Hired designer and will be returned and not reviewed until these approvals are furnished.

1.8 DELEGATED ENGINEERING REQUIREMENTS

A. Contract Documents Design Intent: Drawings and Specifications indicate design intent for products and systems and do not necessarily indicate or specify total Work required. Contract Documents shall not be construed as an engineered design; furnish and install all Work required for a complete installation.

B. Delegated Engineering Professional Qualifications: Professional engineer legally authorized to practice in in the location of the project site and experienced in providing engineering services of kind indicated for products and systems similar to this Project and has a record of successful in-service performance.

1. Refer to each individual section for additional qualifications. Coordinate the requirements of this section and the individual section. Bring any discrepancies to the attention of the Architect.

C. Coordination of Contract Documents and Work:

1. Product Variations: In the event of minor differences between products and systems of acceptable or available manufacturer/fabricators, Contractor shall notify Architect of such differences and resolve conflicts in a timely manner. Failure of Contractor to provide notification shall be construed as acceptance of conditions indicated, and changes caused by minor differences between products and Contract Documents shall be included in the Work at no additional cost to Owner.

2. Allowable Adjustments: Minor dimension and profile adjustments may be made in the interest of fabrication or erection methods or techniques or ability to satisfy design intent, provided design intent is maintained as determined by Architect. Proposed deviations shall include a detailed analysis of impact to adjacent substrates or other building systems, including related design or construction cost impacts. If accepted by Architect, deviations causing changes in materials, constructability, substrates, or conditions shall be included in the Work at no additional cost to Owner.

1.9 GENERAL REQUIREMENTS

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Statement: For each submittal, Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. PREDESIGN MEETINGS

1. The Contractor is required to provide all approved and updated design drawings, design specifications, calculations, and reports to the Owner-Hired Design Professional for review before the meeting.

D. DIVISION 02-48 SPECIFICATION SECTIONS

1. Refer to individual specification sections for additional information for work which design responsibility is delegated, which may include the following:

a. Indication of portions of the Work for which design responsibility is delegated. Contractor should contact the Architect with questions of clarity as needed.
b. Indication in Paragraph 1.2 under “Section Includes” that the scope of the work under the section includes professional design services that are the contractor’s responsibility by stating: “This section includes Delegated Design”. Omission in this paragraph does not relieve the contractor of the delegated scope.
c. Pre-Construction Meetings, if specified, will require the Contractor is responsible to present relevant information in that meeting, whether specifically stated or not.
d. Submittals: Submittal sections may simply state “Delegated Design Submittal” with the portion indicated as a delegated design. Meaning the Contractor should refer to this section and follow the procedures as stated above. Both submittals (Action, Informational) are required regardless where the section states the submittal requirement.

2. If a particular section includes delegated design scope, the procedures in this section apply to the delegated design and are complementary to the specific section.

3. Performance Requirements as may be indicated in each section, include: (Omission of any of the listed items does not relieve the contractor of the delegated scope)

    a. Qualifications and responsibilities of the contractor's designer.
    b. Scope of the Delegated Design
    c. Technical Performance Requirements for the scope of the Delegated design.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. The contractor's designer is responsible for the construction portion of the delegated design. As such, responsible for field verification and the contractor's installation such as:

B. The contractor is to manage the completion of the construction of delegated design portions of the work. Provide all documentation through the submittal requirements in 01 33 00. Include:

1. Site Inspections by Local jurisdictions or other agencies.
2. Testing Agencies Reports and tests.
3. Special Inspections of delegated design items required by Code and Construction Documents
4. Contractor-Hired Design Professional's Site Observations

C. At the request of the Owner, Architect, or Local Jurisdiction provide documentation of:

1. The progress of any installation.
2. The contractor's designer written certification that the work done from their design is substantially complete.

END OF SECTION 013573

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:

1. Section 012100 "Allowances" for testing and inspection allowances.

1.2 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

1. Mockups are used for one or more of the following:

    a. Verify selections made under Sample submittals.
    b. Demonstrate aesthetic effects.
    c. Demonstrate the qualities of products and workmanship.
    d. Demonstrate successful installation of interfaces between components and systems.
    e. Perform preconstruction testing to determine system performance.

2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.

E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 DELEGATED DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Mockup Shop Drawings:

1. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
2. Indicate manufacturer and model number of individual components.
3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.

B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager [may also serve as Project superintendent] [does not have other Project responsibilities].
2. <Insert qualifications appropriate to Project>.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and

inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
3. Owner-performed tests and inspections indicated in the Contract Documents [, including tests and inspections indicated to be performed by Commissioning Authority].

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.

5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

F. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

G. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.
   a. Allow seven days for initial review and each re-review of each mockup.
7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

H. Specialty Mockups: See Section 014339 "Mockups" for additional construction requirements for integrated exterior mockups.

1.10 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Payment for these services will be made from testing and inspection allowances specified in Section 012100 "Allowances," as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Engage a qualified testing agency to perform quality-control services.

a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least [**24**] <**Insert number>** hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

D. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.

1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
2. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in the Statement of Special Inspections attached to this Section, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014150 – SPECIAL INSPECTIONS AND STRUCTURAL TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Special inspections to be performed during the progress of this project.

1.2 RESPONSIBILITY

A. It shall be this Owner's responsibility to contract for Special Inspections; however, the Contractor shall be responsible for proper notification when inspection is required in the progress of the work, providing access to facilitate the inspection and making corrections necessary when work is not in compliance with the Contract Documents.

1.3 REPORTS

A. Copies of inspection reports signed by person performing the inspection or test shall be submitted to Owner's Representative, Architect and Contractor. A copy shall also be kept in the job trailer.

1.4 GENERAL REQUIREMENTS

A. Special Inspections and Structural Testing shall be in accordance with Chapter 1 and Chapter 17 of the 2015 International Building Code.

B. The program of Special Inspections and Structural Testing is a Quality Assurance Program intended to ensure that the work is performed in accordance with the Contract Documents.

C. This specification section is intended to inform the Contractor of the Owner's Quality Assurance Program and the extent of the Contractor's responsibilities. This specification section is also intended to notify the Special Inspector, Testing Laboratory and other Agents of the Special Inspector of their requirements and responsibilities.

1.5 SPECIAL INSPECTIONS

A. Special Inspections shall be performed by a qualified Inspector and/or approved Testing Agency, acceptable to the Building Official.

1. Contractor shall be responsible to notify Inspector in a timely manner when required inspections need to be performed.

1.6 SCHEDULE OF INSPECTION AND TESTS

A. Required inspections and tests are described in the "Statement of Special Inspections" and associated tables within the Structural Drawings.

1.7 QUALIFICATIONS

A. The Testing Laboratory and individual technicians shall be approved by the Architect.

B. The Testing Laboratory shall maintain a full-time licensed Professional Engineer (P.E.) on staff who shall certify the test reports. The Engineer shall be responsible for the training of the testing technicians and shall be in responsible charge of the field and laboratory testing operations.

C. Special inspections shall be performed by inspectors as indicated below:

1. Special inspections of soils may be performed by inspectors with an education and background in geotechnical engineering.
2. Technicians performing sampling and testing of concrete shall be ACI certified "Concrete Field-Testing Technicians - Grade 1".
3. Inspectors performing inspections of concrete work, such as inspections of concrete placement, batching, reinforcing, curing and protection, shall be ICC certified "Reinforced Concrete Special Inspector".
4. Inspectors performing inspections of masonry shall be ICC certified "Structural Masonry Special Inspector".
5. Inspectors performing visual inspections of welding shall be ICC certified "Structural Steel and Welding Special Inspectors". Technicians performing non-destructive testing such as ultrasonic testing, radiographic testing, magnetic particle testing or dye-penetrant testing shall be certified as an ASNT-TC Level II or Level III technicians.
6. Technicians performing standard tests described by specific ASTM Standards shall have training in the performance of such tests and must be able to demonstrate, either by oral or written examination, competence for the test to be conducted. They shall be under the supervision of a licensed Professional Engineer and shall not be permitted to independently evaluate test results.

1.8 ACTION SUBMITTALS

A. The Special Inspector and Testing Laboratory shall submit to the Owner and Architect for review a copy of their qualifications which shall include the names and qualifications of each of the individual inspectors and technicians who will be performing inspections or tests.

B. The Special Inspector and Testing Laboratory shall disclose any past or present business relationship or potential conflict of interest with the Contractor or any of the Subcontractors whose work will be inspected or tested.

1.9 PAYMENT

A. The Owner will contract directly with the Special Inspection Agency. The Special Inspection Agency will submit their invoices directly to the Sponsor.

B. The Contractor shall be responsible for the cost of any retesting or re-inspection of work which fails to comply with the requirements of the Contract Documents.

1.10 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall cooperate with the Special Inspector and his agents so that the Special Inspections and Testing may be performed without hindrance.

B. The Contractor shall review all Special Inspections and shall be responsible for coordinating and scheduling inspections and tests. The Contractor shall notify the Special Inspector or Testing Laboratory at least 48 hours in advance of a required inspection or test. Un-inspected work that required inspection may be rejected solely on that basis.

C. The Contractor shall provide incidental labor and facilities to provide access to the work to be inspected or tested, to obtain and handle samples at the site or at the source of products to be tested, and to facilitate tests and inspection, storage and curing of test samples.

D. The Contractor shall keep at the project site the latest set of construction drawings, field sketches, approved and field use shop and erection drawings, and specifications for use by the Inspectors and Testing technicians.

E. The Special Inspections program shall in no way relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control Program. All work that is to be subjected to Special Inspections shall first be reviewed by the Contractor's Quality Control personnel.

F. The Contractor shall be solely responsible for construction site safety.

1.11 LIMITS ON AUTHORITY

A. The Special Inspector or Testing Laboratory may not release, revoke, alter or enlarge on the requirements of the Contract Documents.

B. The Special Inspector or Testing Laboratory will not have control over the Contractor's means and methods of construction.

C. The Special Inspector or Testing Laboratory shall not be responsible for construction site safety.

D. The Special Inspector or Testing Laboratory has no authority to stop the work.

1.12 RECORDS AND REPORTS

A. Detailed daily reports shall be prepared of each inspection and teat by the Special Inspector and Testing

1. Laboratory. Reports shall include:
2. Date of test or inspection
3. Name of Inspector or Technician

4. Location of specific areas tested or inspected.
5. Description of test or inspection and results
6. Applicable ASTM standard
7. Weather conditions
8. Engineer's seal and signature

B. The Special Inspector shall submit interim reports to the Owner and Building Official at the end of each week which includes all inspections and test reports received that week. Copies shall be sent to the Architect and Contractor.

C. Any discrepancies from the Contract Documents found during a Special Inspection shall be immediately reported to the Contractor and Owner. If the discrepancies are not corrected, the Special Inspector shall notify the Owner and Building Official. Reports shall document all discrepancies identified and the corrective action taken.

D. The Testing Laboratory shall immediately notify the Owner and Building Official by telephone, fax or email of any test results which fail to comply with the requirements of the Contract Documents.

E. At the completion of the work requiring Special Inspections, each Inspection Agency and Testing Laboratory shall provide a statement to the Owner and Building Official that all work was completed in substantial conformance with the Contract Documents and that all appropriate inspections and tests were performed.

1.13 FINAL REPORT OF SPECIAL INSPECTIONS

A. The "Final Report of Special Inspections" shall be completed by the Special Inspector and submitted to the Owner and Building Official prior to the issuance of a "Certificate of Use and Occupancy".

B. The "Final Report of Special Inspections" will certify that all required inspections have been performed and will itemize any discrepancies that were not corrected or resolved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

Chapter 1 Inspections

Chapter 17 SCHEDULE OF SPECIAL INSPECTIONS

Appleton International Airport – Appleton, Wisconsin

Instructions
The Structural Engineer of Record shall determine the material and/or work on the project requiring Special Inspections. The Special Inspection requirements shall be based on Section 1704 of Chapter 17 of the 2015 International Building Code. Any deviations from the requirements of Section 1704 must be approved by the State Engineer's office. If Inspection is by "Other", the inspecting entity shall be identified.

MATERIALS	TYPE OF INSPECTION	SERVICE	INSPECTION BY:		
			Architect	Engineer	Other
Division 0-48	Not Applicable				

MATERIALS	TYPE OF INSPECTION	CODE REFERENCE	PROVIDED BY:		
			Architect	Engineer	Testing Agent
Division 0-48	Not Applicable				

END OF SECTION 014150

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.3 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. APPROVED: “approved,” “acceptable,” “satisfactory,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Architect, subject in each case to the final determination of the Owner. When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. ARCHITECT: Can be defined throughout General Contract Provisions and used interchangeably with the terms Engineer, Design Professional, or Resident Project Representative. The Architect is the person or firm licensed by the State who has the contract responsibility for the Project, who designs and prepares the construction documents from which the building is constructed, and who signs and stamps the required documents. The architect acts on behalf of the owner’s interest and is subject in each case to the final determination of the Owner. The architect also acts for the purpose of protecting the public health, safety, and welfare.

D. DIRECTED: A command or instruction by Architect. Other terms including "requested," "authorized," “ordered,” “designated,” “prescribed,” "selected," "required," and "permitted" have the same meaning as "directed." Whenever, in these specifications or on the plans, the term is intended.

E. INDICATED: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. REGULATIONS: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

G. FURNISH: Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

H. INSTALL: Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

I. PROVIDE: Furnish and install, complete and ready for the intended use.

J. PROJECT SITE: Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.5 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.

10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
11. AF&PA - American Forest & Paper Association; www.afandpa.org.
12. AGA - American Gas Association; www.aga.org.
13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
15. AI - Asphalt Institute; www.asphaltinstitute.org.
16. AIA - American Institute of Architects (The); www.aia.org.
17. AISC - American Institute of Steel Construction; www.aisc.org.
18. AISI - American Iron and Steel Institute; www.steel.org.
19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
21. ANSI - American National Standards Institute; www.ansi.org.
22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
23. APA - APA - The Engineered Wood Association; www.apawood.org.
24. APA - Architectural Precast Association; www.archprecast.org.
25. API - American Petroleum Institute; www.api.org.
26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASSP - American Society of Safety Professionals (The); www.assp.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AVIXA - Audiovisual and Integrated Experience Association; (Formerly: Infocomm International); www.soundandcommunications.com.
38. AWEA - American Wind Energy Association; www.awea.org.
39. AWI - Architectural Woodwork Institute; www.awinet.org.
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
41. AWPA - American Wood Protection Association; www.awpa.com.
42. AWS - American Welding Society; www.aws.org.
43. AWWA - American Water Works Association; www.awwa.org.
44. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
45. BIA - Brick Industry Association (The); www.gobrick.com.
46. BICSI - BICSI, Inc.; www.bicsi.org.
47. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
48. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
49. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
50. CDA - Copper Development Association; www.copper.org.
51. CE - Conformite Europeenne; http://ec.europa.eu/growth/single-market/ce-marking/.
52. CEA - Canadian Electricity Association; www.electricity.ca.
53. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.

54. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
55. CGA - Compressed Gas Association; www.cganet.com.
56. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
57. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
58. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
59. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
60. CPA - Composite Panel Association; www.compositepanel.org.
61. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
62. CRRC - Cool Roof Rating Council; www.coolroofs.org.
63. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
64. CSA - CSA Group; www.csa-group.org.
65. CSI - Construction Specifications Institute (The); www.csiresources.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTA - Consumer Technology Association; www.cta.tech.
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.coolingtechnology.org.
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
71. DHA - Decorative Hardwoods Association; (Formerly: Hardwood Plywood & Veneer Association); www.decorativehardwoods.org.
72. DHI - Door and Hardware Institute; www.dhi.org.
73. ECA - Electronic Components Association; (See ECIA).
74. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
75. ECIA - Electronic Components Industry Association; www.eciaonline.org.
76. EIA - Electronic Industries Alliance; (See TIA).
77. EIMA - EIFS Industry Members Association; www.eima.com.
78. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
79. EOS/ESD Association; (Electrostatic Discharge Association); www.esda.org.
80. ESTA - Entertainment Services and Technology Association; (See PLASA).
81. ETL - Intertek (See Intertek); www.intertek.com.
82. EVO - Efficiency Valuation Organization; www.evo-world.org.
83. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
84. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
85. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
86. FM Approvals - FM Approvals LLC; www.fmglobal.com.
87. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
88. FRSA - Florida Roofing, Sheet Metal Contractors Association, Inc.; www.floridaroof.com.
89. FSA - Fluid Sealing Association; www.fluidsealing.com.
90. FSC - Forest Stewardship Council U.S.; www.fscus.org.
91. GA - Gypsum Association; www.gypsum.org.
92. GANA - Glass Association of North America; (See NGA).
93. GS - Green Seal; www.greenseal.org.
94. HI - Hydraulic Institute; www.pumps.org.
95. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
96. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
97. HPVA - Hardwood Plywood & Veneer Association; (See DHA).
98. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
99. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
100. IAS - International Accreditation Service; www.iasonline.org.

101. ICBO - International Conference of Building Officials; (See ICC).
102. ICC - International Code Council; www.iccsafe.org.
103. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
104. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
105. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
106. IEC - International Electrotechnical Commission; www.iec.ch.
107. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
108. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
109. IESNA - Illuminating Engineering Society of North America; (See IES).
110. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
111. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
112. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.org.
113. II - Infocomm International; (See AVIXA).
114. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
115. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
116. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
117. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
118. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
119. ISO - International Organization for Standardization; www.iso.org.
120. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
121. ITU - International Telecommunication Union; www.itu.int/home.
122. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
123. LMA - Laminating Materials Association; (See CPA).
124. LPI - Lightning Protection Institute; www.lightning.org.
125. MBMA - Metal Building Manufacturers Association; www.mbma.com.
126. MCA - Metal Construction Association; www.metalconstruction.org.
127. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
128. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
129. MHIA - Material Handling Industry of America; www.mhia.org.
130. MIA - Marble Institute of America; (See NSI).
131. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
132. MPI - Master Painters Institute; www.paintinfo.com.
133. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
134. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
135. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
136. NADCA - National Air Duct Cleaners Association; www.nadca.com.
137. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
138. NALP - National Association of Landscape Professionals; www.landscapeprofessionals.org.
139. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
140. NBI - New Buildings Institute; www.newbuildings.org.
141. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
142. NCMA - National Concrete Masonry Association; www.ncma.org.
143. NEBB - National Environmental Balancing Bureau; www.nebb.org.
144. NECA - National Electrical Contractors Association; www.necanet.org.

145. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
146. NEMA - National Electrical Manufacturers Association; www.nema.org.
147. NETA - InterNational Electrical Testing Association; www.netaworld.org.
148. NFHS - National Federation of State High School Associations; www.nfhs.org.
149. NFPA - National Fire Protection Association; www.nfpa.org.
150. NFPA - NFPA International; (See NFPA).
151. NFRC - National Fenestration Rating Council; www.nfrc.org.
152. NGA - National Glass Association (The); (Formerly: Glass Association of North America); www.glass.org.
153. NHLA - National Hardwood Lumber Association; www.nhla.com.
154. NLGA - National Lumber Grades Authority; www.nlga.org.
155. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
156. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
157. NRCA - National Roofing Contractors Association; www.nrca.net.
158. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
159. NSF - NSF International; www.nsf.org.
160. NSI - National Stone Institute; (Formerly: Marble Institute of America); www.naturalstoneinstitute.org.
161. NSPE - National Society of Professional Engineers; www.nspe.org.
162. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
163. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
164. NWFA - National Wood Flooring Association; www.nwfa.org.
165. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
166. PDI - Plumbing & Drainage Institute; www.pdionline.org.
167. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
168. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
169. RFCI - Resilient Floor Covering Institute; www.rfci.com.
170. RIS - Redwood Inspection Service; www.redwoodinspection.com.
171. SAE - SAE International; www.sae.org.
172. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
173. SDI - Steel Deck Institute; www.sdi.org.
174. SDI - Steel Door Institute; www.steeldoor.org.
175. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
176. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
177. SIA - Security Industry Association; www.siaonline.org.
178. SJI - Steel Joist Institute; www.steeljoist.org.
179. SMA - Screen Manufacturers Association; www.smainfo.org.
180. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
181. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
182. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
183. SPIB - Southern Pine Inspection Bureau; www.spib.org.
184. SPRI - Single Ply Roofing Industry; www.spri.org.
185. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
186. SSINA - Specialty Steel Industry of North America; www.ssina.com.
187. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
188. STI - Steel Tank Institute; www.steeltank.com.
189. SWI - Steel Window Institute; www.steelwindows.com.
190. SWPA - Submersible Wastewater Pump Association; www.swpa.org.

191. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
192. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
193. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
194. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
195. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
196. TMS - The Masonry Society; www.masonrysociety.org.
197. TPI - Truss Plate Institute; www.tpinst.org.
198. TPI - Turfgrass Producers International; www.turfgrasssod.org.
199. TRI - Tile Roofing Institute; www.tileroofing.org.
200. UL - Underwriters Laboratories Inc.; www.ul.com.
201. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
202. USAV - USA Volleyball; www.usavolleyball.org.
203. USGBC - U.S. Green Building Council; www.usgbc.org.
204. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
205. WA - Wallcoverings Association; www.wallcoverings.org.
206. WASTEC - Waste Equipment Technology Association; www.wastec.org.
207. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
208. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
209. WDMA - Window & Door Manufacturers Association; www.wdma.com.
210. WI - Woodwork Institute; www.wicnet.org.
211. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov/fdsys.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.

11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.govinfo.gov.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.

    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.

6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. Wisconsin Bureau of Aeronautics (WBOA) or (BOA)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 014339 - MOCKUPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General information and requirements for constructing mockups. Use this section for general mockup requirements and administrative submittal requirements.
2. Standalone Exterior Mockup – Exterior Enclosure Assembly.
3. Room Mockup – Ceiling Assemblies Only.

1.2 DEFINITIONS

A. Mockups (General) are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

B. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as part of permanent construction, consisting of multiple products, assemblies, and subassemblies.

C. Room Mockups: Mockups of typical interior spaces with complete ceiling finishes as indicated.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, testing and inspecting agency representative, and installers of major systems whose Work is included in integrated exterior and room mockups.
2. Review coordination of equipment and furnishings provided by the Owner for room mockups.
3. Review locations and extent of mockups.
4. Review testing procedures to be performed on mockups.
5. Review and finalize schedule for mockups, and verify availability of materials, personnel, equipment, and facilities needed to complete mockups and testing and maintain schedule for the Work.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Include all relevant data and products that will be used on the mockup.

B. Shop Drawings: For integrated exterior and room mockups.

1. Mockup Plan: Detailed, dimensioned plans and elevations showing mockup size, and items and materials that will be included in proposed mockup.
2. Indicate the proposed locations for each mockup.
3. Locate mockups so they do not interfere with the progress of construction.
4. Submit drawings relevant to the construction of the mockup. Include shop drawings with plans, elevations, and sections.

C. Schedule:

1. Include the time frame for starting and completing the mockup.
2. Include estimated dates that the mockup will be available for observation, inspection, or testing.

D. Delegated Design Submittal:

1. For temporary structural supports for mockups not attached to building structure, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Room Mockup Coordination Drawings: Insert description of drawing type and other details, drawn to scale and coordinated with each other, using input from installers of the items involved:

1.6 QUALITY ASSURANCE

A. Build mockups to do the following:

1. Verify selections made under Sample submittals.
2. Demonstrate aesthetic effects.
3. Demonstrate the qualities of products and workmanship.
4. Demonstrate acceptable coordination between components and systems.
5. Perform preconstruction testing, such as window air- and water-leakage testing.

B. Fabrication: Before fabricating or installing portions of the Work requiring mockups, build mockups for each form of construction and finish required. Use materials and installation methods as required for the Work.

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed unless otherwise indicated.

C. Notifications:

1. Notify Architect seven days in advance of the dates and times when mockups will be constructed.
2. Allow seven days for initial review and each re-review of each mockup.

D. Approval: Obtain Architect's approval of mockups before starting fabrication or construction of corresponding Work.

1. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 COORDINATION

A. Coordinate schedule for construction of mockups, so construction, testing, and review of mockups do not impact Project schedule.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design support structure for free-standing mockups.

B. Structural Performance:

1. Wind Loads: As indicated on Drawings.

C. Mockup Testing Performance Requirements: Perform tests using design pressures and performance criteria indicated for assemblies and products that are specified in other Sections and incorporated into integrated exterior mockups.

2.2 INTEGRATED EXTERIOR MOCKUPS

A. Construct integrated exterior mockups according to approved mockup Shop Drawings. Construct mockups to demonstrate constructability, coordination of trades, and sequencing of Work; and to ensure materials, components, subassemblies, assemblies, and interfaces integrate into a system complying with indicated performance and aesthetic requirements.

B. Design and construct foundation and superstructure to support free-standing integrated exterior mockups.

C. Build integrated exterior mockups using installers and construction methods that will be used in completed construction.

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D. Use specified products that have been approved by Architect. Coordinate installation of materials and products specified in individual Specification Sections that include Work included in integrated exterior mockups.

E. Provide and document modifications to construction details and interfaces between components and systems required to properly sequence the Work, or to pass performance testing requirements. Obtain Architect's approval for modifications.

F. Retain approved mockups constructed in place. Incorporate fully into the Work.

2.3 ROOM MOCKUPS

A. Build room mockups according to approved mockup Shop Drawings to evaluate constructability, demonstrate the coordination of trades and sequencing of Work, and to demonstrate aesthetic requirements. Include each visible finish, component, and equipment item within room mockups; include operable lighting.

PART 3 - EXECUTION

3.1 TESTING OF INTEGRATED EXTERIOR MOCKUPS

A. Integrated Exterior Mockup Testing Agency: Engage a qualified testing agency to perform tests and inspections.

1. Testing and inspecting agency will interpret tests and state in each report whether tested Work complies with or deviates from requirements.

B. Integrated Exterior Mockup Testing Services: Perform the following tests in the following order:

1. Water-Spray Test: Before installation of interior finishes has begun, test areas designated by Architect in accordance with AAMA 501.2 for evidence of water penetration.

a. Perform a minimum of two tests in areas as directed by Architect.

2. Air Leakage: Test in accordance with ASTM E783 at 1.5 times the rate specified in "Mockup Testing Performance Requirements" Paragraph in "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. (0.45 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

a. Perform a minimum of two tests in areas as directed by Architect.

3. Water Penetration: Test in accordance with ASTM E1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Mockup Testing Performance Requirements" Paragraph

in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft. (300 Pa) and verify no evidence of water penetration.

C. Integrated exterior mockup will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 014339

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Align these requirements with the civil related documents, overlap exists with building related materials and civil related materials. Products specified in each section are requirements, product used can apply to multiple scopes of work if needed.

1.2 SUMMARY

A. This Section includes requirements for temporary facilities, Interim Life Safety, Security, and Protection of all temporary facilities and controls.

B. Coordinate and refer to the Temporary Utilities section 015100 and the project requirements for the Field Offices and Sheds in section 015213.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.4 PROJECT CONDITIONS

A. Temporary Construction Facilities are required to meet the International Building Code – 2015, this includes but not necessarily limited to the Egress and Life Safety provisions of the code.

B. This project consists of phasing and sequencing. Temporary facilities and controls are required to be maintained, installed, or removed as it pertains to each phase and allow the airport to maintain its full operation. It is the responsibility of the contractor to plan and schedule for the phases.

C. Temporary Use of Permanent Facilities and buildings under construction.

1. This project is required to follow the NFPA 241- Standard for Safeguarding Construction, Alteration, and Demolition Operations.
2. Interim Life Safety is required at all buildings under construction and must meet the applicable requirements in the California Building Code – 2024, and the means of egress provisions of 4.6.10 of the NFPA-101 – Life Safety Code.
3. Service: The service requirements are found in the Temporary Utilities under the 01 51 00 section.

1.5 ACTION SUBMITTALS

A. Site Plan

1. Show temporary facilities, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Project Identification and Temporary Signs

1. Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

C. Fire-Safety Program

1. Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

D. Moisture- and Mold-Protection Plan

1. Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.

a. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
b. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
c. Indicate methods to be used to avoid trapping water in finished work.

E. Dust- and HVAC-Control Plan

1. Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

a. Locations of dust-control partitions at each phase of work.
b. HVAC system isolation schematic drawing.
c. Location of proposed air-filtration system discharge.
d. Waste-handling procedures.
e. Other dust-control measures.

F. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:

1. Methods used to meet the goals and requirements of the Owner.

2. Concrete cutting method(s) to be used.
3. Location of construction devices on the site.
4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.
6. Indicate locations of sensitive equipment areas or other areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.

G. Coordinate the requirements from this section with the 015213 – Field offices and Sheds.

H. Coordinate the requirements from this section with the phasing submittals required in other documents.

1.6 QUALITY ASSURANCE

A. Construction site and areas to meet the requirements in the code and NFPA-241.

B. Restrooms and Sanitation for the construction site will meet the OSHA’s State-Specific Regulations and where applicable the Federal OSHA job safety and health.

C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Field Offices

1. Contractor related field offices: A site for office trailer(s) should the General Contractor or Prime-Sub-Contractors, wish to set one up, will be designated, if space is available, by the owner.
2. Architect’s Field Office: At a minimum, the General Contractor will provide an Architect’s field office and it will meet the requirements in this section and consist of the items and requirements in Field Offices and Sheds under the 015213 section.

B. Storage

1. Sheds and Containers: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations. All Sheds and Containers will meet the requirements listed in this section and in Field Offices and Sheds under the 015213 section.
2. Storage of Flammable/combustible liquids/gases:

    a. Are not allowed on site and need to be stored off-site at contractor’s expense and properly secured and stored.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures within the code.

B. Standpipes: If required, will meet the requirements in NFPA-241.

C. Restrooms and Sanitation for the construction site will meet the OSHA's State-Specific Regulations and where applicable the Federal OSHA job safety and health program.

D. HVAC Equipment

1. Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

   a. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   b. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction and marked for intended location and application.
   c. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures."

E. Air-Filtration Units

1. Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

F. Chiller Equipment

1. Provide self-contained temporary chiller equipment and associated piping and controls to ensure required cooling system capacity is provided throughout renovation of chiller plant and related systems.

2.3 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.

B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.

C. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain-link fence, sized to height of fence, in color selected by Architect from manufacturer's standard colors.

D. Wood Enclosure Fence: Plywood, 6 feet (1.8 m) high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart.

E. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.

F. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches (914 by 1524 mm).

G. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

H. Provide all barriers and temporary partition assemblies to meet the requirements as shown on the G-series sequencing sheets and related specification sections.

PART 3 - EXECUTION

3.1 GENERAL

A. Construction Personnel: Contractor’s employees and personnel, project inspectors and regulatory representatives, owner and owners staff, and the design professionals shall all have access to using the temporary facilities including the temporary toilets per the local and state regulations and requirements and as defined in the documents.

3.2 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.3 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.4 SANITARY FACILITIES

A. Provide temporary toilets, wash facilities, and drinking water for use by construction personnel. Comply with requirements of the local code and the authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities is not permitted unless otherwise noted by Owner.

3.5 WORK AREAS:

A. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.

2. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.

a. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.

3. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.

4. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

B. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.6 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area as approved by Owner and within 30 feet (9 m) of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
2. Utilize designated area for temporary field offices.

3. Maintain support facilities until Architect issues Substantial Completion. Remove after Substantial Completion. Personnel remaining after Substantial Completion.

B. Temporary Roads and Paved Areas

1. Comply with the Civil portion of the documents. Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated in the documents.

a. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations. Return all temporary roads to condition existing before initial use or in a condition acceptable to Owner.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Civil documents.
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Civil Documents.

D. Traffic Controls

1. Comply with requirements of authorities having jurisdiction.

a. Protect existing site improvements to remain, including curbs, pavement, and utilities.
b. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking

1. Use designated areas for construction personnel.

F. Storage and Staging

1. Use designated areas of Project site for storage and staging needs.

G. Dewatering Facilities and Drains

1. Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

a. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
b. Remove snow and ice as required to minimize accumulations.

H. Project Signs

1. Provide Project signs as indicated. Unauthorized signs are not permitted.

a. Identification Signs: Provide Project identification signs as indicated on Drawings.
b. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

1) Provide temporary, directional signs for construction personnel and visitors.

c. Maintain and touch up signs, so they are legible at all times.

I. Waste Disposal Facilities

1. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
2. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017000 "Execution Requirements."

J. Lifts and Hoists

1. Provide facilities necessary for hoisting materials and personnel.
2. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

K. Temporary Elevator Use:

1. Use of elevators is not permitted.
2. See Division 14 elevator Section for temporary use of new elevators.

L. Existing Elevator Use

1. Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

a. Do not load elevators beyond their rated weight capacity.
b. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work, so no evidence remains of correction work. Return items that cannot be refinished in

field to the shop, make required repairs and refinish entire unit, or provide new units as required.

M. Temporary Stairs

1. Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

N. Existing Stair Usage

1. Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

a. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas, so no evidence remains of correction work.

O. Temporary Use of Permanent Stairs

1. Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.7 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. General:

1. Comply with drawings and Notes on drawings, and this section.

B. Protection of Existing Facilities

1. Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

a. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

C. Environmental Protection

1. Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

a. Comply with work restrictions specified in Section 011000 "Summary."

D. Temporary Erosion and Sedimentation Control

1. Comply with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent, and requirements specified in Section 312010 "Earth Moving for Building and Structures".

E. Temporary Erosion and Sedimentation Control

1. Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.

   a. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
   b. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
   c. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
   d. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

F. Stormwater Control

1. Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

G. Tree and Plant Protection

1. Comply with requirements specified in Section 015600 "Temporary Barriers and Controls."
2. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

H. Pest Control

1. Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

I. Site Enclosure Fence

1. Before construction operations begin and complying with the preparation phase requirements located on the G-series drawings, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
2. Comply with Airport requirements for security into the Airport site as a whole all fencing scope needs to be approved by owner.
3. Extent of Fence: As indicated on Drawings for each phase.

4. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

J. Security Enclosure and Lockup

1. Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

K. Barricades, Warning Signs, and Lights

1. Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

L. Temporary Egress

1. Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

M. Covered Walkway

1. Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.

    a. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
    b. Paint and maintain appearance of walkway for duration of the Work.

N. Temporary Enclosures

1. Comply with drawings and Notes on drawings, and this section
2. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior. Manage enclosures with the requirements as indicated on drawings.

    a. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

O. Temporary Partitions

1. Comply with drawings and Notes on drawings, and this section
2. Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise. Comply with drawings.

    a. Construct dustproof partitions as indicated on drawings and use materials that are consistent within the respective specifications.

b. Comply with requirements and assemblies indicated on drawings, however where not indicated on drawings and needed, Construct:

1) Construct dustproof partitions with gypsum wallboard, with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side. or
2) A Dustproof partition with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
3) Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.

3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
4. Insulate partitions to control noise transmission to occupied areas.
5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
6. Protect air-handling equipment.
7. Protect all Gates, Aircraft, and Aircraft related equipment. Coordinate with Owner if Aircraft related equipment needs to be address or protected by contractor.
8. Provide walk-off mats at each entrance through temporary partition.

P. Temporary Fire Protection

1. Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

a. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
b. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction. Permits may be required, contractor is responsible to pay for obtain any welding-relating compliance.
c. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
d. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.8 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection

1. Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. Exposed Construction Period

1. Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

   a. Protect porous materials from water damage.
   b. Protect stored and installed material from flowing or standing water.
   c. Keep porous and organic materials from coming into prolonged contact with concrete.
   d. Remove standing water from decks.
   e. Keep deck openings covered or dammed.
   f. Comply with all Manufactures requirements for exposure to elements.

C. Partially Enclosed Construction Period

1. Before or After each construction phase or after installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

   a. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   b. Keep interior spaces reasonably clean and protected from water damage.
   c. Periodically collect and remove waste containing cellulose or other organic matter.
   d. Discard or replace water-damaged material.
   e. Do not install material that is wet.
   f. Discard and replace stored or installed material that begins to grow mold.
   g. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

D. Controlled Construction Period

1. After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

   a. Control moisture and humidity inside building by maintaining effective dry-in conditions.
   b. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials. Refer to product and manufactures requirements.
   c. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

      1) Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.

2) Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
3) Remove and replace materials:

a) That cannot be completely restored to their manufactured moisture level within 48 hours.
b) That become warped, distorted, damaged, or aesthetically look different to the native appearance. Architect's or Owner can have the discretion of the appearance.

3.9 OPERATION, TERMINATION, AND REMOVAL

A. Supervision

1. Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance

1. Maintain facilities in good operating condition until removal.

a. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover

1. Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal

1. Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

a. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
b. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant

materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

c. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 015100 - TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for temporary utilities.

B. Coordinate with the Temporary Facilities and Controls section 015000 and the project requirements for the Field Offices and Sheds in section 015213.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.4 PROJECT CONDITIONS

A. This project consists of phasing and sequencing. Temporary utilities are required to be maintained, installed, or removed as it pertains to each phase and allow the airport to maintain its full operation. It is the responsibility of the contractor to plan and schedule for the phases.

B. Temporary use of permanent utilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance.

1. This applies to the installer regardless of previously assigned responsibilities.
2. This applies to the installer within new construction and within the existing construction to be demolished.

1.5 USE CHARGES

A. General

1. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants and staff of Site, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service

1. From Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service

1. From Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

D. HVAC and Fuel or Electric Power Service for temporary heat if required during the Chiller Plant renovation:

1. Contractor will pay for all HVAC, fuel and electric service for temporary heat as required to maintain required for heating renovation and new construction of project throughout construction operations. The Contractor shall not use the Owner’s equipment, fuel, or electrical power for temporary heat.

1.6 INFORMATIONAL SUBMITTALS

A. Site Utility Plan

1. Show temporary utility lines and connections for each phase and for each utility needed at each of the work areas including the chiller plant, if needed.

B. Implementation and Termination Schedule:

1. As part of the preconstruction submittals and no later than Twenty (20) days before the established date of commencement of the Work, submit a schedule indicating implementation and termination dates of each temporary utility.

a. Include temporary chiller plant as needed to ensure no interruption in cooling of the existing facility during renovation of the chiller plant and cooling systems.

1.7 QUALITY ASSURANCE

A. Temporary Use of Permanent Facility Utility service:

1. Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Electric Service

1. Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

C. Tests and Inspections

1. Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEMPORARY UTILITY INSTALLATION

A. General

1. Install temporary service or connect to existing service.

a. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage

1. Provide temporary utilities to remove effluent lawfully.

a. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service

1. Install water service and distribution piping in sizes and pressures adequate for construction.
2. Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Electric Power Service

1. Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
2. Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

a. Install electric power service as indicated by Owner.
b. Connect temporary service to Owner's existing power source, as directed by Owner.

E. Telephone Service:

1. Provide temporary telephone service in common-use facilities for use by all construction personnel.
2. Install WiFi cell phone access equipment and one land-based telephone line(s) for each field office.
3. Provide additional telephone lines for the following:

a. Provide one telephone line(s) for Owner's use.

4. At each telephone, post a list of important telephone numbers.

    a. Police and fire departments.
    b. Ambulance service.
    c. Contractor's home office.
    d. Contractor's emergency after-hours telephone number.
    e. Architect's office.
    f. Engineers' offices.
    g. Owner's office.
    h. Principal subcontractors' field and home offices.

F. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.

G. Internet for Project Computer: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip the computer to match what the General contractor is using in their field office and not less than the following:

1. Processor: Intel Core i7 with vPro.
2. Memory: 16 gigabyte.
3. Disk Storage: 1 -terabyte hard-disk drive
4. Display: 27-inch (610-mm) LCD monitor with 256-Mb dedicated video RAM.
5. Full-size keyboard and mouse.
6. Network Connectivity: To match general Contractors.
7. Operating System: Microsoft Windows 10 Professional.
8. Productivity Software:

    a. Bluebeam Revu
    b. Microsoft Office Professional, 2013 or higher, including Word, Excel, and Outlook.

9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
10. Internet Service: Broadband modem, router, and ISP, equipped with hardware firewall, providing minimum 10.0 -Mbps upload and 15 -Mbps download speeds at each computer. Match general Contractors Internet Service
11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.
12. Backup: External hard drive, minimum 2 terrabytes, with automated backup software providing daily backups.

3.2 END OF SECTION 015100

SECTION 015600 - TEMPORARY BARRIERS AND ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Standard Specifications, Proposal Documents, Special Provisions, Supplemental Specifications, Bid Item Manual and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

1. Requirements on Temporary Barriers and Enclosures:

    a. Temporary partitions

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.4 INSTALLATION AND REMOVAL

A. Provide temporary controls in order to execute the Work expeditiously.

B. Remove from site all such work after use.

1.5 PARTITIONS

A. Erect temporary site enclosures using the partitions and barriers as indicated on drawings and comply with the G-series sheets and requirements. Finish temporary site enclosures per Owner’s security approval. The requirements are indicated in the G-series sheets. Wayfinding signage for occupants will be required to direct passengers as barriers are put in place. Contractor to manage barriers and wayfinding for each phase.

B. Apply barriers, barricades, enclosures, plywood panels, or chain link fence, plastic and fabric as directed by the documents requirements and approved by Owner and security.

C. Conform to the Civil documents and G-sheets. Provide at least one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

D. Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law and airport security.

E. Paint public side of site enclosure in selected colors with one coat primer to the current version of CGSB 1.189M standard on wood surfaces and one coat exterior paint to the current version of CGSB 1.59. on metal and wood surfaces. Maintain public side of enclosure in clean condition.

F. Paint public side of interior partitions and enclosures in selected colors with one coat primer and maintain a Level 5 finish on interior gypsum partitions as defined GA-214-2015 Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced gypsum panels.

G. Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.6 GUARD RAILS AND BARRICADES

A. Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

B. Provide as required by governing authorities.

1.7 WEATHER ENCLOSURES

A. Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

B. Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

C. Erect enclosures to allow access for installation of materials and working inside enclosure.

D. Design enclosures to withstand wind pressure and snow loading.

1.8 DUST TIGHT SCREENS

A. Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

B. Maintain and relocate protection until such work is complete.

1.9 ACCESS TO SITE

A. Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

B. Build and maintain temporary roads where indicated or directed and provide snow removal during period on work.

C. If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor’s use of roads.

1.10 PUBLIC TRAFFIC FLOW

A. Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.11 EGRESS, RALLY POINTS, AND EVACUATION ROUTES

A. Maintain access to property including overhead clearances for use by emergency response vehicles.

B. Provide egress for all occupants. All temporary egress routes meet accessibility and fire codes during construction.

C. Provide and or maintain the rally points for exit discharge from the building.

1.12 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

A. Protect surrounding private and public property from damage during performance of Work.

B. Be responsible for damage incurred.

1.13 PROTECTION OF BUILDING FINISHES

A. Provide protection for finished and partially finished building finishes and equipment during performance of Work.

B. Provide necessary screens, covers, and hoardings.

C. Confirm with Owner's Representative locations and installation schedule 3 days prior to installation.

D. Be responsible for damage incurred due to lack of or improper protection.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015600

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of This Section Includes: Administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
2. Section 012100 "Allowances" for products selected under an allowance.
3. Section 012500 "Substitution Procedures" for requests for substitutions.
4. Section 014200 "References" for applicable industry standards for products specified.
5. Section 017700 "Closeout Procedures" for submitting warranties.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products unless otherwise indicated.
3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluating Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements

for purposes of evaluating comparable products of additional manufacturers named in the specification. [**Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.**]

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in "Comparable Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."

F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.

1.3 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Resolution of Compatibility Disputes between Multiple Contractors:
   a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
   b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products will be used.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is inconspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

a. Name of product and manufacturer.
b. Model and serial number.
c. Capacity.
d. Speed.
e. Ratings.

3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.4 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
2. Store products to allow for inspection and measurement of quantity or counting of units.
3. Store materials in a manner that will not endanger Project structure.
4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections are to be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of Owner or endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
   a. Submit additional documentation required by Architect [**through Construction Manager**] in order to establish equivalency of proposed products. Unless

otherwise indicated, evaluation of "or equal" product status is by Architect, whose determination is final.

B. Product Selection Procedures:

1. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience [**will**] [**will not**] be considered [**unless otherwise indicated**].
   a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."

2. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
   a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation within [**seven**] <**Insert number>** days of receipt of a request for a comparable product. Architect will notify Contractor [**through Construction Manager**] of approval or rejection of proposed comparable product within [**15**] <**Insert number>** days of receipt of request, or [**seven**] <**Insert number>** days of receipt of additional information or documentation, whichever is later.

1. Architect's Approval of Submittal: [Marked with approval notation from Architect's action stamp] [Marked with approval notation from Architect's and Construction Manager's action stamp] [Indication of approval in web-based Project management software] <Insert method>. See Section 013300 "Submittal Procedures."
2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Standard Specifications, Proposal Documents, Special Provisions, Supplemental Specifications and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the work, including but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements. Equally Note:

1. Division 01 Section "Submittal Procedures" for submitting surveys.
2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
3. Related portions of General Provisions and Special Provisions.
4. Division 02 Section “Selective Demolition.

1.4 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

1.6 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from the Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before

fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the project horizontal control and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels, excess vibration or RF interference.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with

other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
   a. Utilize containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work and to maintain ongoing operations.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components.

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017000

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Procedural requirements for cutting and patching.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.4 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity that result in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or

in occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete/Masonry/Asphalt: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
5. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Exterior Pavements: Where concrete and asphalt pavements are removed protect remaining pavement rom damage. Make openings by sawing completely through existing pavement.
    a. Pavement may be broken out after initial saw cuts in the event pavement thickness prevents cutting through.
    b. Where sawing is not possible, make openings by drilling holes around perimeter of opening and the chipping out the pavement.
        1) Holes shall be sufficient in number to prevent damage to remaining pavement.
    c. Oversize required openings in existing pavement by 1-inch on all sides and build back to required opening sized by means of the following:

1) Concrete: Nonshrink grout epoxy bonded to the existing concrete.
2) Asphalt: Cold-patch asphalt to existing.

4. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

5. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

SECTION 017419.13 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.3 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements.

1.4 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and deposit in landfill or incinerator acceptable to authorities having jurisdiction.

1.5 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste become property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.6 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 30 days of date established for the Notice of Award.

1.7 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition waste. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons (tonnes).
4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

H. Qualification Data: For Waste Management Coordinator and the refrigerant recovery technician

I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

J. Refrigerant Recovery: Comply with requirements in Section 024119 "Selective Demolition" for refrigerant recovery submittals.

1.8 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.

B. Refrigerant Recovery Technician Qualifications:

1. Universal certified by EPA-approved certification program.
2. Comply with requirements in Section 024119 "Selective Demolition."

C. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.

D. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.9 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Use Form CWM-1 for construction waste and Form CWM-2 for demolition waste. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste and Form CWM-4 for demolition waste. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work in compliance with Section 024119 "Selective Demolition."
2. Salvaged Materials for Sale: Not allowed.

3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there were no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use Form CWM-5 for construction waste and Form CWM-6 for demolition waste. Include the following:

1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include transportation and tipping fees and cost of collection containers and handling for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in transportation and tipping fees by donating materials.
7. Savings in transportation and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

1.10 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 30 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:
   a. Asphalt paving.
   b. Concrete.
   c. Concrete reinforcing steel.
   d. Brick.
   e. Concrete masonry units.
   f. Wood studs.
   g. Wood joists.
   h. Plywood and oriented strand board.
   i. Wood paneling.
   j. Wood trim.
   k. Structural and miscellaneous steel.
   l. Rough hardware.
   m. Roofing.
   n. Insulation.

o. Doors and frames.
p. Door hardware.
q. Windows.
r. Glazing.
s. Metal studs.
t. Gypsum board.
u. Acoustical tile and panels.
v. Carpet.
w. Carpet pad.
x. Demountable partitions.
y. Equipment.
z. Cabinets.
aa. Plumbing fixtures.
bb. Piping.
cc. Supports and hangers.
dd. Valves.
ee. Sprinklers.
ff. Mechanical equipment.
gg. Refrigerants.
hh. Electrical conduit.
ii. Copper wiring.
jj. Lighting fixtures.
kk. Lamps.
ll. Ballasts.
mm. Electrical devices.
nn. Switchgear and panelboards.
oo. Transformers.
pp. Trees, Shrubs, or other Plantings

2. Construction Waste:
   a. Masonry and CMU.
   b. Lumber.
   c. Wood sheet materials.
   d. Wood trim.
   e. Metals.
   f. Roofing.
   g. Insulation.
   h. Carpet and pad.
   i. Gypsum board.
   j. Piping.
   k. Electrical conduit.
   l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
      1) Paper.
      2) Cardboard.
      3) Boxes.
      4) Plastic sheet and film.
      5) Polystyrene packaging.
      6) Wood crates.

7) Wood pallets.
8) Plastic pails.

m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:
1) Paper.
2) Aluminum cans.
3) Glass containers.

PART 2 - PRODUCTS

2.1 LABELS

A. Labels, Signs, and instructions should be clear, and easy to understand. All containers should be clearly labeled and list the acceptable and unacceptable materials to be placed into each receptacle.

1. Use labels, signs, graphics, symbols and language from Recycle Across America(R); a 501(c)(3) nonprofit organization,
2. Whenever possible, labels should be in multiple-languages, especially in Spanish, and in graphic symbols.

B. These same instructions are required to be posted throughout the site.

2.2 BINS AND CONTAINERS

A. Whenever possible, obtain bins from Recycle Across America(R); a 501(c)(3) nonprofit organization,

1. At a minimum all bins and containers are required to have:
a. Labels, Signs and instructions that are clear, and easy to understand.
b. Use signs, graphics, symbols and language from Recycle Across America(R); a 501(c)(3) nonprofit organization,
c. Whenever possible, labels should be in multiple-languages, especially in Spanish, and in graphic symbols.

B. Dumpsters:

1. At minimum dumpsters are required to have:
a. Labels, Signs and instructions that are clear, and easy to understand.
b. Use signs, graphics, symbols and language from Recycle Across America(R); a 501(c)(3) nonprofit organization,
c. Whenever possible, labels should be in multiple-languages, especially in Spanish, and in graphic symbols.

2.3 RECYCLING RECEIVERS AND PROCESSORS

A. Subject to compliance with requirements, available recycling receivers and processors include, but are not limited to, the following:

1. As directed by the owner

2.4 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Bins, Containers, and Labels:

1. Change-out loaded containers for empty containers, as demand requires.

E. Use signs, graphics, symbols and language from Recycle Across America(R); a 501(c)(3) nonprofit organization,

1. Whenever possible, labels should be in multiple-languages, especially in Spanish, and in graphic symbols.
2. Post a summary of the container instructions at location throughout the construction site

F. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities. Conduct the waste management plans and the construction and demolition in such a manner to minimize damage to trees, plants and natural landscape environment.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 015600 “Temporary Barriers and Enclosures” and 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

2.5 SALVAGING DEMOLITION WASTE

A. Comply with requirements in Section 024119 "Selective Demolition" for salvaging demolition waste.

B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

C. Salvaged Items for Sale: Not permitted on Project site.

D. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

F. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

G. Plumbing Fixtures: Separate by type and size.

H. Lighting Fixtures: Separate lamps by type and protect from breakage.

I. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

2.6 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

2.7 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

END OF SECTION 017419.13

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final Completion procedures.
3. List of incomplete items.
4. Submittal of Project warranties.
5. Final cleaning.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
2. Section 013233 "Photographic Documentation" for submitting Final Completion construction photographic documentation.
3. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
4. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
5. Section 017900 "Demonstration and Training" for requirements to train Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 DEFINITIONS

A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of [**10**] <**Insert number>** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by . Label with manufacturer's name and model number.
    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
5. Submit testing, adjusting, and balancing records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of [**10**] <**Insert number>** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
6. Advise Owner of changeover in utility services.

7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of [**10**] <**Insert number>** days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect [**and Construction Manager**] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit Final Completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect [**and Construction Manager**] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, [**starting with exterior areas first**] [**and**] [**proceeding from lowest floor to highest floor**], listed by room or space number.
2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect [and Construction Manager].
   d. Name of Contractor.
   e. Page number.

4. Submit list of incomplete items in the following format:
   a. PDF Electronic File: Architect [**, through Construction Manager,**] will return annotated file.
   b. Web-Based Project Software Upload: Utilize software feature for creating and updating list of incomplete items (punch list).

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within [**15**] <**Insert number>** days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit by uploading to web-based project software site .

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
   a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
   c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
   d. Remove tools, construction equipment, machinery, and surplus material from Project site.
   e. Remove snow and ice to provide safe access to building.
   f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   h. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
   i. Vacuum and mop concrete.
   j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
   k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

l. Remove labels that are not permanent.
m. Wipe surfaces of mechanical and electrical equipment [**, elevator equipment,**] and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
p. Clean ducts, blowers, and coils [if units were operated without filters during construction or that display contamination with particulate matter on inspection].
1) Clean HVAC system in compliance with [**NADCA ACR.**] [**Section 230130.52 "Existing HVAC Air-Distribution System Cleaning."**] Provide written report on completion of cleaning.
q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
r. Clean strainers.
s. Leave Project clean and ready for occupancy.

C. Construction Waste Disposal: Comply with waste-disposal requirements in [Section 015000 "Temporary Facilities and Controls."] [Section 017419 "Construction Waste Management and Disposal."]

3.2 CORRECTION OF THE WORK

A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Systems and equipment operation manuals.
3. Systems and equipment maintenance manuals.
4. Product maintenance manuals.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:

1. Submit on digital media acceptable to Architect by email to Architect. Enable reviewer comments on draft submittals.
2. Submit three paper copies. Architect will return two copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
4. Supplementary Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.5 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Name and contact information for Commissioning Authority.
8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
9. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the

Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.6 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:

1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.7 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.

3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.8 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

    a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and

flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of maintenance manuals.

1.9 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. As-Built or As-Constructed Record Drawings.
2. As-Built or As-Constructed Record specifications.
3. As-Built or As-Constructed Record Product Data.
4. As-Built or As-Constructed Miscellaneous record submittals.

1.2 RELATED WORK

A. Review all Division 01 Sections.

B. Divisions 02 through 49 Sections for specific requirements. Equally Note:

1. See Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. As-Built Drawings/Specifications/Product Data: Also referred to as As-Constructed Record Drawings, they are prepared by the contractor. They illustrate, in red ink, on-site changes to the original construction documents reflecting the as constructed condition of the Work.

B. Record Drawings: Record drawings are prepared by the architect and reflect on-site changes the contractor noted in the as-built drawings. They are often compiled as a set of on-site changes made for the owner per the owner-architect contract.

1.4 CLOSEOUT SUBMITTALS

A. As-Constructed Record Documents Summary: Comply with the following:

1. For each major phase: After occupancy of Phase 1

a. Submit one (1) set of marked-up As-Constructed Record Drawings
b. Submit one (1) set of marked-up As-Constructed Record Specifications include one (1) copy of Project's Specifications, including addenda and contract modifications.
c. Submit one (1) set of marked-up As-Constructed Record Product Data of each Product Data submittal.

2. Final Submittal: After occupancy of Phase 2

a. Submit one (1) set of marked-up As-Constructed Record Drawings

b. Submit one (1) set of marked-up As-Constructed Record Specifications include one (1) copy of Project's Specifications, including addenda and contract modifications.
c. Submit one (1) set of marked-up As-Constructed Record Product Data of each Product Data submittal.

B. As-Constructed Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.

C. As-Constructed Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous As-Constructed Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit written report Monthly indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.5 AS-CONSTRUCTED RECORD DRAWINGS

A. As-constructed Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark As-constructed record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained As-constructed record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up As-constructed record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.

h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up As-constructed record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as for the original Contract Drawings.
2. Format: PDF’s using Microsoft Windows 10 operating system.
3. Format: Annotated the PDF’s in the electronic file using Bluebeam and indicating the mark-ups in red.
4. Incorporate changes and additional information previously marked on As-constructed record prints. Delete, redraw, and add details and notations where applicable.
5. Refer instances of uncertainty to Architect for resolution.
6. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.

C. Format: Identify and date each As-constructed Record Drawing; include the designation "AS-CONSTRUCTED RECORD DRAWING" in a prominent location.

1. As-constructed Record Prints: Organize As-constructed record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.
b. Date.
c. Designation " AS-CONSTRUCTED RECORD DRAWINGS."

d. Name of Architect.
e. Name of Contractor.

1.6 AS-CONSTRUCTED RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether As-constructed Record Product Data has been submitted in operation and maintenance manuals instead of submitted as As-constructed Record Product Data.
5. Note related Change Orders, As-constructed Record Product Data, and As-constructed Record Drawings where applicable.

B. Format: Submit As-constructed record specifications as annotated PDF electronic file.

1.7 AS-CONSTRUCTED RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for As-constructed Project Record Document purposes. Post changes and revisions to As-constructed Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark As-constructed Product Data to indicate the actual product installation where installation varies substantially from that indicated in As-constructed Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, As-constructed Record Specifications, and As-constructed Record Drawings where applicable.

C. Format: Submit As-constructed Record Product Data as annotated PDF electronic file.

1. Include As-constructed Record Product Data directory organized by Specification Section number and title, electronically linked to each item of As-constructed Record Product Data.

1.8 MISCELLANEOUS AS-CONSTRUCTED RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous As-constructed record submittals as PDF electronic file.

1. Include miscellaneous As-constructed record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.9 MAINTENANCE OF AS-CONSTRUCTED RECORD DOCUMENTS

A. Maintenance of As-constructed Record Documents: Store As-constructed Record Documents in the field office apart from the Contract Documents used for construction. Do not use As-constructed Project Record Documents for construction purposes. Maintain As-constructed Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to As-constructed Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Instruction in operation and maintenance of systems, subsystems, and equipment.

1.2 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.3 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

a. System, subsystem, and equipment descriptions.
b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.
d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:

a. Emergency manuals.
b. Systems and equipment operation manuals.
c. Systems and equipment maintenance manuals.
d. Product maintenance manuals.
e. Project Record Documents.
f. Identification systems.
g. Warranties and bonds.
h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

a. Instructions on meaning of warnings, trouble indications, and error messages.
b. Instructions on stopping.
c. Shutdown instructions for each type of emergency.
d. Operating instructions for conditions outside of normal operating limits.
e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

a. Startup procedures.
b. Equipment or system break-in procedures.
c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning.

e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

1.4 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

1.5 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017900

SECTION 019113 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general requirements that apply to implementation, tracking, and verification of the commissioning process without regard to specific systems, assemblies, or components.

B. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:

1. Verify that the work is installed in accordance with Contract Documents and the manufacturer’s recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Construction Verification Checklists executed by Contractor are utilized to achieve this.
2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Provider are utilized to achieve this.
3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
4. Verify that the Owner’s operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

C. The Commissioning Provider directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Provider's responsibilities.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Section 017800 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

C. Section 070800 "Commissioning of Thermal and Moisture Protection" for commissioning process activities for thermal and moisture protection systems, assemblies, and components.

D. Section 080800 "Commissioning of Exterior Building Envelope" for commissioning process activities for exterior building envelope systems, assemblies, and components.

E. Section 210800 "Commissioning of Fire Suppression" for commissioning process activities for fire suppression systems, assemblies, equipment, and components.

F. Section 220800 "Commissioning of Plumbing" for commissioning process activities for plumbing systems, assemblies, equipment, and components.

G. Section 230800 "Commissioning of HVAC" for commissioning process activities for HVAC&R systems, assemblies, equipment, and components.

H. Section 260800 "Commissioning of Electrical" for commissioning process activities for electrical systems, assemblies, equipment, and components.

I. Section 270800 "Commissioning of Telecommunications" for commissioning process activities for telecommunication systems, assemblies, equipment, and components.

1.3 DEFINITIONS

A. Basis of Design (BoD): A document that records concepts, calculations, decisions, and product selections used to meet the Owners Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

B. Building Enclosure Commissioning Process (BECxP): Commissioning process focused on the planned enclosure and related system interactions during design. Development of mock-up procedures, air infiltration metrics, and water infiltration metrics are incorporated into the specifications at this stage of the project.

C. Commissioning (Cx): The process of ensuring that systems are designed, installed, functionally tested and performing in conformity with the Owner’s Project Requirements and that the building operator has received complete equipment and systems documentation and training.

D. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.

E. Commissioning Design Review: Independent review of the design documents as they related specifically to the Basis of Design and Owner’s Project Requirement’s. This design review commonly focuses on system/facility performance, efficiency, maintainability, and reliability. Design reviews were complete at the Design Document and 98% Construction Documents.

F. Commissioning Meetings: Meetings conducted by the commissioning provider to address items specifically identified by the commissioning team. This meeting focuses on identifying project challenges proactively and determining and proactive solution.

G. Commissioning Provider (CxP): The entity identified by the Owner or Project Manager to lead, monitor, coordinate and report on project commissioning activities. The commissioning provider may be the project A/E (most common), or an independent third party.

H. Commissioning Plan: A detailed plan of the organization, schedule, allocation of resources, procedures and documentation requirements of the commissioning process.

I. Commissioning Report: A document that records the activities and results of the commissioning process.

J. Commissioning Site Visit: Site visits conducted by the commissioning provider regularly to review progress, identify challenges, and determine applicable solutions. The commissioning provider will commonly check in with all team members to discuss project progress.

K. Commissioning Software: A web-based interface utilized to track commissioning documentation and activities through substantial completion. All commissioning documentation including (but not limited to); meeting minutes, site observation reports, construction verification checklists, functional performance tests, and the issues list.

L. Commissioning Status List: A list of corrective items identified by the commissioning team. The list includes the identified deficiency, assigned team member, and anticipated correction. The items will remain on the status list until they are corrected and verified by the team as resolved.

M. Commissioning Team: The team of project members representing the owner, A/E, general contractor, construction manager, each discipline of subcontractors, and led by the commissioning provider.

N. Controls Page-Turn: Meeting held after the temperature controls submittal has been submitted and approved to discuss the intended sequence of operations, system architecture, installation requirements and schedule. This meeting is attended by the commissioning provider, A/E, general contractor, temperature controls contractor, and test and balance contractor.

O. Construction Verification Checklists: A quality control verification process performed by the installer as building assemblies, components, equipment and systems are being installed which documents that the materials, installation procedures, interfaces with other trades, start-up, testing and operation are correct, complete, in compliance with contract documents and manufacturer’s recommendations and are ready for functional performance testing.

P. Functional Performance Tests (FPT): Contractor testing of installed building assemblies, components, equipment, systems and interfaces which confirms correct performance through all operating modes and compliance with contract documents and manufacturer’s recommendations.

Q. Owner’s Project Requirements: A written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. The Concept and BR has been identified as the “Owner’s Project Requirement’s” for this project.

R. Seasonal Testing: Functional Testing Procedures conducted during the opposite season as the original functional testing efforts. This testing is completed to verify system operation has been optimized and all alarms associated with the opposite season are set accordingly. These tests commonly verify; freeze stat settings, discharge air reset strategies, hot water reset strategies, humidification modes, and dehumidification modes.

S. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.4 COMMISSIONING TEAM

A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to,

representatives of each Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxP.

B. Members Appointed by Owner:

1. Commissioning Provider (CxP): The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxP under a separate contract.
2. Representatives of the facility user and operation and maintenance personnel.
3. Architect and engineering design professionals.

1.5 OWNERS RESPONSIBILITIES

A. Provide the OPR documentation to the CxP and each Contractor for information and use.

B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

C. Provide the BoD documentation, prepared by Architect and approved by Owner, to the CxP and each Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.6 CONTRACTOR RESPONSIBILITIES

A. Each Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:

1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
2. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
3. Attend commissioning team meetings held on a monthly basis. At specific times during the construction process there may be meetings held every other week as needed.
4. Integrate and coordinate commissioning process activities with construction schedule.
5. Review and accept construction verification checklists provided by the CxP.
6. Complete electronic construction checklists as Work is completed and provide to the Commissioning Provider on a weekly basis. Commissioning documentation will be maintained utilizing a commissioning software.
7. Review and accept commissioning process test procedures provided by the Commissioning Provider.
8. Complete commissioning process test procedures.

1.7 COMMISSIONING PROVIDER RESPONSIBILITIES

A. Organize and lead the commissioning team.

B. Provide commissioning plan.

C. Develop the Commissioning Software project account and invite all Cx team members to participate.

D. Convene commissioning team meetings.

E. Submittals: The commissioning provider provides third party review of submittals for equipment included in the construction verification list below. The commissioning provider should be copied on all submittals in parallel with the A/E and will respond directly to the A/E for consideration to be incorporated into the formal A/E response. The formal submittal process will be discussed and finalized during the project commissioning kick-off meeting.

F. Provide project-specific construction checklists and commissioning process test procedures.

G. Verify the execution of commissioning process activities using random sampling. The sampling rate may vary from 1 to 100 percent. Verification will include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports to verify compliance with the OPR. When a random sample does not meet the requirement, the CxA will report the failure in the Issues Log.

H. Prepare and maintain the Commissioning Status Log ("Issues Log").

I. Prepare and monitor completed construction verification checklists via the commissioning software.

J. Witness systems, assemblies, equipment, and component startup.

K. Witness, participate, and verify Functional Performance Testing is completed to replicate the intended design strategies per the construction documents.

L. Compile test data, inspection reports, and certificates; include them in the systems manual and commissioning process report.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup, initial checkout and required Functional Testing. Unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:

1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F (0.3 degree C) and resolution of plus/minus 0.1 degree F (0.05 degree C).
2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.

3. Calibration: According to the manufacturer's recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.

1. Dataloggers required to for Functional Tests will be provided by the Commissioning Provider and will not become the property of Owner.

PART 3 - EXECUTION

3.1 MEETINGS

A. Each contractor is required to attend meetings related to commissioning (pre-construction, construction progress, commissioning meetings, etc.) and have personnel requested by CxP in attendance to facilitate quality control and coordinate commissioning efforts.

B. The CxP will present an overview of the project's commissioning process at the pre-construction meeting. The commissioning team members will be identified, and their responsibilities reviewed.

C. At subsequent meetings, contractors are to provide a review of project progress, a report on the status of issues, commissioning tasks and scheduling for future commissioning tasks.

3.2 SCHEDULING

A. Reference General Conditions Article 13 for Contractor responsibilities for scheduling. Each contractor shall provide the Contractor a detailed schedule and regular updates of commissioning tasks for incorporation into the project schedule.

3.3 COMMISSIONING PLAN

A. Commissioning Provider has prepared the Commissioning Plan.

1. Attend meetings called by the Commissioning Provider for purposes of completing the commissioning plan.
2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:

1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Provider within 60 days after award of Contract.
2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
3. Construction Verification Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
4. Provide sufficient notice to Commissioning Provider for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.4 COMMISSIONING SOFTWARE

A. The commissioning process will utilize a web-based commissioning software track, document installation, and manage the construction verification checklists and functional performance tests. During the construction kick-off meeting each discipline will identify a commissioning team representative to participate in commissioning meetings, manage the construction checklists for their discipline, and interact with the team. Directly following the construction kick-off meeting each identified discipline representative will be invited to join the Team thru the BlueRithm commissioning software.

B. Each contractor is responsible for completing action items, construction checklists, and functional testing documentation using the software and in a timely manner.

3.5 COMMISSIONING STATUS LIST

A. Each contractor is responsible for completing action items in a timely manner that are noted in the Status List as their responsibility. Upon completion the team member shall indicate the completion thru the commissioning software to indicate the measure is ready for verification. Timely response and successful completion are a requirement to avoid withholding of payment.

3.6 CxP SITE VISITS

A. Commissioning is a team effort requiring the cooperation of all parties. Contractors are to proactively carry out their commissioning responsibilities and are to assist the CxP during site visits in performing system installation verifications. This includes providing access to and demonstrating the installation, operation, and testing of commissioned systems; responding to CxP requests for information; carrying out proactive and corrective actions; and accurate reporting on system status and conditions

3.7 STARTUP PLANS AND REPORTS

A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.

B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

C. Submit directly to the Commissioning Provider.

3.8 CONSTRUCTION VERIFICATION CHECKLISTS

A. The construction verification checklists are a formalized means to provide individual workers the criteria for a successful installation, adherence to the construction documents and to easily track construction progress.

B. Each assembly, component, equipment, system and interface to be commissioned shall be verified by the installer at the site while work is underway and documented on the construction verification checklists available through the commissioning software implemented for this project. The contractor is responsible for successfully completing installations, documenting this on the construction verification checklist forms and correcting all deficiencies.

1. No sampling of identical or near-identical items is allowed.
2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.

C. Contractor shall periodically review the construction verification schedule with the CxP allowing advance notice of activities of 5 business days so that the CxP may witness when necessary. If CxP identifies more than a 10% discrepancy rate during confirmation of construction verification, the contractor shall correct all deficiencies and revalidate all items covered by that checklist and resubmit new checklists. The cost of reconfirmation of construction verification due to equipment or construction deficiencies is the responsibility of the contractor and subject to deductive change order at the owner’s discretion. Correction of deficiencies and revalidation are the responsibility of the contractor and are not subject to time extensions or delay claims.

D. Contractor is responsible for filling out Construction Verification Checklist, during installation and before startup; witnessing by the Commissioning Provider is not required unless otherwise specified.

1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
4. If any Checklist line item is not relevant, record reasons on the form.
5. Contractor may independently perform startup inspections and/or tests, at Contractor's option.

6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
7. Submit completed Checklists to Commissioning Provider within two days of completion.

E. Commissioning Provider is responsible for furnishing the Construction Verification Checklists to Contractor.

1. Provide all additional information requested by Commissioning Provider to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
2. Commissioning Provider may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in Contract Documents or not.
3. When asked to review the proposed Checklists, do so in a timely manner.

F. Commissioning Provider Witnessing: Required for:

1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
2. A sampling of non-primary equipment, as allowed by the commissioning plan.

G. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.

1. If difficulty in correction would delay progress, report deficiency to the Commissioning Provider immediately.

3.9 FUNCTIONAL PERFORMANCE TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Complete the functional performance test procedures included on the functional performance test forms provided within the commissioning documentation or software used for this project. Coordinate with Owner, A/E and CxP so they may witness and document test results.

C. CxP shall establish sampling protocol and at the time of testing select sample test locations for identical pieces of equipment. Where simulation of conditions or altering of setpoints or values is required to achieve an operating or failure mode for testing, the contractor must receive CxP approval.

D. Contractors are responsible for completion and coordination of their work with all trades prior to testing, preplanning testing procedures, performing preliminary functional performance testing using test forms, ensuring necessary staff and resources are on hand and expediting testing. This includes completion of testing and balancing by the HVAC contractor required for successful functional performance testing. Failure to complete or coordinate work, preplan or have staff and resources available to carry out testing will result in retesting. Contact the CxP informing them the system is ready for review prior to scheduling testing for witnessing

E. Commissioning Provider is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

F. Contractor shall coordinate testing with the CM, the A/E, and CxP 10 business days prior to the scheduled testing. Scheduling is to confirm the systems are ready for functional testing and available to be witnessed and test results documented. All contractors involved with specific assemblies, components, equipment, systems and interfaces shall have qualified installers and technicians present at the same time working together to perform testing and demonstrate correct performance through all operating and failure modes and compliance with contract documents and manufacturer's recommendations.

G. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Provider will document the deficiency and the Contractor's stated intentions regarding correction.

1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with Contract Documents, is not complete, not ready for testing, failure of planning, or does not perform properly.
2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Provider; the Commissioning Provider will reschedule the test and the Contractor shall re-test.
3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
4. Contractor shall bear the cost of Owner and Commissioning Provider personnel time witnessing re-testing.
5. Contractor shall bear the cost of Owner and Commissioning Provider personnel time witnessing re-testing if the test failed due to failure to execute the relevant Construction Verification Checklists correctly; if the test failed for reasons that would not have been identified in the Construction Verification Checklists process, Contractor shall bear the cost of the second and subsequent re-tests.

H. Functional Test Procedures:

1. Some test procedures are included in Contract Documents; where Functional Test procedures are not included in Contract Documents, test procedures will be determined by the Commissioning Provider with input by and coordination with Contractor.
2. Retesting is required when testing cannot be successfully completed. Deficiencies requiring retesting include:
   a. Incomplete work and/or coordination with others
   b. Inadequate preparation of systems for testing
   c. Inadequate preplanning
   d. Inadequate staff, equipment, tools or resources for testing
   e. Material, equipment or construction deficiencies
   f. Incomplete or failed test due to reasons under the Contractor's responsibility

3. The cost of retesting is the responsibility of the contractor and subject to deductive change order at DFD's discretion. Correction of deficiencies and retesting are the responsibility of the contractor and are not subject to time extensions or delay claims.

4. Examples of Functional Testing:
   a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
   b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.
   c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.
   d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Provider is Functional Testing.

5. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

3.10 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gauges, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Commissioning Provider and Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Construction Verification Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:

1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
2. Verify that sensors with shielded cable are grounded only at one end.
3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F (0.1 degree C) of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:

1. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
2. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.

1. Disconnect sensor.
2. Connect a signal generator in place of sensor.
3. Connect ammeter in series between transmitter and building automation system control panel.
4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
7. Record all values and recalibrate controller as necessary to comply with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
8. Reconnect sensor.
9. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
10. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
11. If not, replace sensor and repeat.
12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:

1. Watthour, Voltage, Amperage: 1 percent of design.
2. Pressure, Air, Water, Gas: 3 percent of design.
3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F (0.2 degree C).
4. Relative Humidity: 4 percent of design.
5. Barometric Pressure: 0.1 inch of Hg (340 Pa).
6. Flow Rate, Air: 10 percent of design.
7. Flow Rate, Water: 4 percent of design.
8. AHU Wet Bulb and Dew Point: 2.0 degrees F (1.1 degrees C).

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:

1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
2. Set pump/fan to normal operating mode.
3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
4. Command valve/damper to open; verify position is full open and adjust output signal as required.
5. Command valve/damper to a few intermediate positions.
6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.

1. With full pressure in the system, command valve closed.
2. Use an ultra-sonic flow meter to detect flow or leakage.

3.11 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:

1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
2. Sampling is not allowed for:
   a. Major equipment.
   b. Life-safety-critical equipment.
   c. Construction Verification Checklist execution.

3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
7. If YY percent of the units in the second sample fail, test all remaining identical units.
8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Provider may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:

1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Provider's request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
2. Other points will be monitored by the Commissioning Provider using dataloggers.
3. At the option of the Commissioning Provider, some control system monitoring may be replaced with datalogger monitoring.
4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
5. Graphical output is desirable and is required for all output if the system can produce it.
6. Monitoring may be used to augment manual testing.

3.12 OPERATION AND MAINTENANCE MANUALS

A. See Section 017800 - Closeout Submittals for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Provider for review; make changes recommended by Commissioning Provider.

D. Commissioning Provider will add commissioning records to manuals after submission to Owner.

3.13 DEMONSTRATION AND TRAINING

A. Provide owner training using final O&M data. The Contractor is responsible for developing a cohesive training plan for all equipment and systems required in the project specifications. The plan should include the agenda including topics, objectives, and teaching outline to be covered for each section, the instructor's name and contact information, and the anticipated duration and schedule for each session, a formal training record listing attendee and a training evaluation form. Develop the training schedule including number of hours required within the specifications for each component or system in coordination with the CM, CxP and owner that complies with the owner's and CxP's availability. Submit a preliminary training plan to the CM, owner and CxP for review and finalize the plan to incorporate comments received.

B. Training sessions to include classroom and site presentations as appropriate. Demonstrate operation of systems and equipment. Review setpoints and operating parameters. Demonstrate preventive and routine maintenance procedures as well as common repairs. Videotape training sessions providing reasonable video/audio quality and provide final record in labeled DVD format to agency along with a sign off sheet demonstrating receipt by the agency.

C. The CxP shall provide each trainee with a Training Evaluation Form and at completion of training collect forms for review. Based on evaluations and CxP training review, contractor shall repeat training sessions which CxP determines were inadequate or incomplete.

D. Refer to specification 01 77 00 DEMONSTRATION AND TRAINING for general requirements regarding training.

3.14 SUBSTANTIAL COMPLETION REVIEW MEETING

A. Within 10 months of substantial completion and prior to completion of warranty period, CxP shall coordinate and facilitate a substantial completion review meeting. The intent of the meeting will be to review the project design, construction, turnover, operation and warranty issues. Contractor is required to have key project personnel in attendance and participating in the review for the purpose of making future project delivery improvements.

3.15 COMMISSIONING REPORT

A. CxP shall provide the construction manager and owner a draft commissioning report for the project upon substantial completion and a final commissioning report after the Seasonal Testing and Substantial Completion meeting. This report shall include contact information for key members of the commissioning team; description of commissioned systems, commissioning activities, sampling protocol and results; and findings and recommendations from substantial completion meeting. The report to also include the Owner’s Project Requirements, Basis of Design/Design Concept and Functional Performance Test forms.

END OF SECTION 019113

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
3. Section 017300 "Execution" for cutting and patching procedures.
4. Section 013516 "Alteration Project Procedures" for general protection and work procedures for alteration projects.
5. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 QUALITY ASSURANCE

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:
   a. <Insert items to be removed by Owner>.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

C. Sustainable Design Requirements for Building Reuse:

1. Maintain the existing building structure, envelope, and interior nonstructural elements of a historic building or contributing building in a historic district. Do not demolish such existing construction beyond indicated limits.
2. Maintain the existing building structure, envelope, and interior nonstructural elements of an abandoned or blighted building. Do not demolish such existing construction beyond indicated limits.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings preconstruction photographs or video [**and**] .

1. Inventory and record the condition of items to be removed and salvaged.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.

5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

B. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least <**Insert number**> hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly. [Comply with requirements in Section 017419 "Construction Waste Management and Disposal."]

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 024296 "Historic Removal and Dismantling."

D. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Protect items from damage during transport and storage.

E. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition [**and cleaned**] and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site [and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.] [and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."]

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Form-facing material for cast-in-place concrete.
2. Shoring, bracing, and anchoring.

1.3 DEFINITIONS

A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.

B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1. Review the following:
   a. Special inspection and testing and inspecting agency procedures for field quality control.
   b. Construction, movement, contraction, and isolation joints
   c. Forms and form-removal limitations.
   d. Shoring and reshoring procedures.
   e. Anchor rod and anchorage device installation tolerances.

1.5 ACTION SUBMITTALS

A. Product Data: For each of the following:

1. Exposed surface form-facing material.
2. Form ties.
3. Form-release agent.

1.6 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.7 QUALITY ASSURANCE

1.8 DELIVERY, STORAGE, AND HANDLING

A. Form Liners: Store form liners under cover to protect from sunlight.

B. Insulating Concrete Forms: Store forms off ground and under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

C. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.

1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.
    a. For architectural concrete specified in Section 033300 "Architectural Concrete," limit deflection of form-facing material, studs, and walers to 0.0025 times their respective clear spans (L/400).

B. Design, engineer, erect, shore, brace, and maintain insulating concrete forms in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.

1. Design cross ties to transfer the effects of the following loads to the cast-in-place concrete core:
    a. Wind Loads: As indicated on Drawings.
        1) Horizontal Deflection Limit: Not more than 1/240 of the wall height.

2.2 FORM-FACING MATERIALS

A. As-Cast Surface Form-Facing Material:

1. Provide continuous, true, and smooth concrete surfaces.
2. Furnish in largest practicable sizes to minimize number of joints.
3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete, and as follows:
   a. Plywood, metal, or other approved panel materials.
   b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      1) APA HDO (high-density overlay).
      2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
      3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
      4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.

2.3 RELATED MATERIALS

A. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

B. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

C. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
2. Form release agent for form liners shall be acceptable to form liner manufacturer.

D. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

PART 3 - EXECUTION

3.1 INSTALLATION OF FORMWORK

A. Comply with ACI 301.

B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete" for as-cast finishes .

C. Limit concrete surface irregularities as follows:

1. Surface Finish-1.0: ACI 117 Class D, 1 inch.
2. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
3. Surface Finish-3.0: ACI 117 Class A, 1/8 inch.

D. Construct forms tight enough to prevent loss of concrete mortar.

1. Minimize joints.
2. Exposed Concrete: Symmetrically align joints in forms.

E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.

1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
3. Install keyways, reglets, recesses, and other accessories, for easy removal.

F. Do not use rust-stained, steel, form-facing material.

G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.

1. Provide and secure units to support screed strips
2. Use strike-off templates or compacting-type screeds.

H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.

1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
2. Locate temporary openings in forms at inconspicuous locations.

I. Chamfer exterior corners and edges of permanently exposed concrete.

J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.

K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.

1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

L. Construction and Movement Joints:

1. Construct joints true to line with faces perpendicular to surface plane of concrete.
2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
3. Place joints perpendicular to main reinforcement.
4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.

a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.

1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.

N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
3. Clean embedded items immediately prior to concrete placement.

3.3 REMOVING AND REUSING FORMS

A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.

1. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work.

1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
2. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.

1. Align and secure joints to avoid offsets.
2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1. Review the following:
   a. Special inspection and testing and inspecting agency procedures for field quality control.
   b. Construction contraction and isolation joints.
   c. Steel-reinforcement installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Bar supports.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.

1. Location of construction joints is subject to approval of Architect.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For testing and inspection agency.

B. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Store reinforcement to avoid contact with earth.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60 , deformed.

2.2 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
   a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.

C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

1. Finish: Plain .

2.3 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Do not cut or puncture vapor retarder.
2. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
2. Stagger splices in accordance with ACI 318.

3.3 JOINTS

A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement.
2. Continue reinforcement across construction joints unless otherwise indicated.
3. Do not continue reinforcement through sides of strip placements of floors and slabs.

B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

3.4 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel-reinforcement placement.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Section 033543 "Polished Concrete Finishing" for concrete floors scheduled to receive a polished concrete finish.
4. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixtures.
   c. Concrete Subcontractor.
   d. Special concrete finish Subcontractor.

2. Review the following:
   a. Special inspection and testing and inspecting agency procedures for field quality control.
   b. Construction joints, control joints, isolation joints, and joint-filler strips.
   c. Semirigid joint fillers.
   d. Vapor-retarder installation.

e. Anchor rod and anchorage device installation tolerances.
f. Cold and hot weather concreting procedures.
g. Concrete finishes and finishing.
h. Curing procedures.
i. Forms and form-removal limitations.
j. Shoring and reshoring procedures.
k. Methods for achieving specified floor and slab flatness and levelness.
l. Concrete repair procedures.
m. Concrete protection.
n. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
o. Protection of field cured field test cylinders.

1.4 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Aggregates.
5. Admixtures:
   a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
6. Vapor retarders.
7. Curing materials.
8. Joint fillers.
9. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Synthetic micro-fiber content.
10. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
11. Intended placement method.
12. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
   a. Location of construction joints is subject to approval of the Architect.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Adhesives.
5. Vapor retarders.
6. Semirigid joint filler.
7. Joint-filler strips.
8. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Aggregates.

D. Field quality-control reports.

E. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician .

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I Type V , gray .
2. Fly Ash: ASTM C618, Class C or F.

3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:
   a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.

2. Maximum Coarse-Aggregate Size: 1 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.

D. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.3 FIBER REINFORCEMENT

A. Synthetic Monofilament Micro-Fiber: Monofilament polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C1116/C1116M, Type III, 1/2 to 1-1/2 inches long.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
   b. GCP Applied Technologies Inc.
   c. Master Builders Solutions, brand of MBCC Group, a Sika company.
   d. Sika Corporation.

2.4 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A ; not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Stego Industries, LLC.
   b. W. R. Meadows, Inc.

2.5 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:
   a. Ambient Temperature Below 50 deg F: Black.
   b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
   c. Ambient Temperature Above 85 deg F: White.

B. Water: Potable or complying with ASTM C1602/C1602M.

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber .

2.7 REPAIR MATERIALS

A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.8 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 25 percent by mass.
3. Total of Fly Ash and Slag Cement: 40 percent by mass, with fly ash not exceeding 25 percent by mass and slag cement not exceeding 25 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

2.9 CONCRETE MIXTURES

A. Class A : Normal-weight concrete used for footings, grade beams, and tie beams.

1. Exposure Class: ACI 318 F0 S1 W0 C1 .
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm: 0.50 .
4. Slump Limit: 4 inches , plus or minus 1 inch .
5. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

B. Class C : Normal-weight concrete used for interior slabs-on-ground.

1. Exposure Class: ACI 318 F0 S1 W0 C1 .
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm: 0.45 .
4. Minimum Cementitious Materials Content: 520 lb/cu. yd. .
5. Slump Limit: 4 inches , plus or minus 1 inch .
6. Air Content:
   a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
7. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
8. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than a rate of 1.0 lb/cu. yd. .

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3.4 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.
    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.5 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.

2. Place joints perpendicular to main reinforcement.
   a. Continue reinforcement across construction joints unless otherwise indicated.
   b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.7 FINISHING FORMED SURFACES

3.8 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.

3.9 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 8 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.
   a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   b. Cast anchor-bolt insert into bases.
   c. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.10 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
   a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
   b. Continuous Sprinkling: Maintain concrete surface continuously wet.
   c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
   d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.

e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
   1) Recoat areas subject to heavy rainfall within three hours after initial application.
   2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:
   a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
      1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
         a) Lap edges and ends of absorptive cover not less than 12 inches.
         b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
      2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
         a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
         b) Cure for not less than seven days.
      3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
         a) Water.
         b) Continuous water-fog spray.
   b. Floors to Receive Curing and Sealing Compound:
      1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
      2) Recoat areas subjected to heavy rainfall within three hours after initial application.
      3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.11 TOLERANCES

A. Conform to ACI 117.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s).
2. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
   a. Limit cut depth to 3/4 inch.
   b. Make edges of cuts perpendicular to concrete surface.
   c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
   d. Fill and compact with patching mortar before bonding agent has dried.
   e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
   a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
   b. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
   a. Correct low and high areas.
   b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that

penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
   a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
   a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.
   a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
   b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
   a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
   b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
   c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
   d. Place, compact, and finish to blend with adjacent finished concrete.
   e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
   a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
   b. Dampen cleaned concrete surfaces and apply bonding agent.
   c. Place patching mortar before bonding agent has dried.
   d. Compact patching mortar and finish to match adjacent concrete.
   e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

C. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
   a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M:
   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.

3. Concrete Temperature: ASTM C1064/C1064M:
   a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

4. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Compression Test Specimens: ASTM C31/C31M:
   a. Cast and laboratory cure two sets of four 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C39/C39M.
   a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
   b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
   c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests:
    a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
        1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.15 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

SECTION 042200 - CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Decorative concrete masonry units.
3. Pre-faced concrete masonry units.
4. Mortar and grout.
5. Steel reinforcing bars.
6. Masonry-joint reinforcement.
7. Embedded flashing.
8. Miscellaneous masonry accessories.
9. Masonry-cell fill.

B. Products Installed but not Furnished under This Section:

1. Cast-stone trim in concrete unit masonry.

C. Related Requirements:

1. Section 031000 "Concrete Forms and Accessories" for dovetail slots for masonry anchors.
2. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
3. Section 071900 "Water Repellents" for water repellents applied to unit masonry assemblies.
4. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.
5. Section 089516 "Wall Vents" for wall vents (brick vents).
6. Section 323223 "Segmental Retaining Walls" for dry-laid, concrete unit retaining walls.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:

1. Decorative CMUs, in the form of small-scale units.
2. Pre-faced CMUs.
3. Colored mortar.
4. Weep holes/vents.

D. Samples for Verification: For each type and color of the following:

1. Exposed CMUs.
2. Pre-faced CMUs.
3. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Material Certificates: For each type and size of the following:

1. Masonry units.
   a. Include data on material properties
   b. For masonry units **used in structural masonry**, include data and calculations establishing average net-area compressive strength of units.
2. Integral water repellant used in CMUs.
3. Cementitious materials. Include name of manufacturer, brand name, and type.
4. Mortar admixtures.
5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
6. Grout mixes. Include description of type and proportions of ingredients.
7. Reinforcing bars.
8. Joint reinforcement.
9. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test in accordance with ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
2. Include test reports, in accordance with ASTM C1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined in accordance with TMS 602/ACI 530.1/ASCE 6.

E. Cold-Weather and Hot Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified in accordance with ASTM C1093 for testing indicated.

B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
2. Protect approved sample panels from the elements with weather-resistant membrane.
3. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
    a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with TMS 602/ACI 530.1/ASCE 6.
2. Determine net-area compressive strength of masonry by testing masonry prisms in accordance with ASTM C1314.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners unless otherwise indicated.

B. Integral Water Repellent: Provide units made with integral water repellent for exposed units

1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested in accordance with ASTM E514/E514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, show no visible water or leaks on the back of test specimen.

C. Insulated CMUs: Where indicated, units contain rigid, specially shaped, molded-polystyrene insulation units complying with ASTM C578, Type I, designed for installing in cores of masonry units.

D. CMUs: ASTM C90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi
2. Density Classification: Normal weight
3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

E. Concrete Building Brick: ASTM C55.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi
2. Density Classification: Normal weight
3. Size (Actual Dimensions): to match existing

F. Decorative CMUs: ASTM C90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi
2. Density Classification: Normal weight.
3. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.
4. Pattern and Texture:
   a. To match existing

5. Colors: to match existing
6. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

G. Pre-faced CMUs: Lightweight **hollow** concrete units complying with ASTM C90, with manufacturer's standard smooth resinous facing complying with ASTM C744.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi
2. Size: to match existing
3. Colors and Patterns: to match existing

2.5 CONCRETE AND MASONRY LINTELS

A. General: Provide one of the following:

B. Concrete Lintels Matching CMU in Color, Texture: ASTM C1623, matching density classification; and with reinforcing bars indicated.

C. Precast or Formed-in-Place Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 032000 "Concrete Reinforcing," and with reinforcing bars indicated.

D. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content is not more than 0.1 percent when tested in accordance with ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C91/C91M.

E. Mortar Cement: ASTM C1329/C1329M.

F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.

G. Aggregate for Mortar: ASTM C144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

H. Aggregate for Grout: ASTM C404.

I. Epoxy Pointing Mortar: ASTM C395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

J. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

K. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

L. Water: Potable.

2.7 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A951/A951M.

1. Exterior Walls: Hot-dip galvanized carbon steel.
2. Wire Size for Side Rods: 0.148-inch diameter.
3. Wire Size for Cross Rods: 0.148-inch diameter.
4. Spacing of Cross Rods: Not more than 16 inches o.c.
5. Provide in lengths of not less than 10 feet , with prefabricated corner and tee units.

2.8 TIES AND ANCHORS

A. General: Ties and anchors extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Mill-Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A641/A641M, Class 1 coating.
2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
3. Stainless Steel Wire: ASTM A580/A580M,
4. Galvanized-Steel Sheet: ASTM A653/A653M, Commercial Steel, G60 zinc coating.
5. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
6. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666,
7. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire.
2. Tie Section: Triangular-shaped wire tie made from 0.187-inch diameter, hot-dip galvanized steel wire.

D. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section
2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hot-dip galvanized steel wire.

E. Partition Top Anchors: 0.105-inch- thick metal plate with a 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube.

F. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated

1. Corrosion Protection: Hot-dip galvanized to comply with ASTMA 153/A153M

2.9 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch thick.
2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
3. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.

B. Flexible Flashing: Use one of the following unless otherwise indicated:

1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch
2. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.030 inch
3. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.
4. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D4637/D4637M, 0.040 inch thick.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing or flexible flashing with a metal drip edge or elastomeric thermoplastic flashing with a drip edge or flexible flashing with a metal sealant stop.
4. Where flashing is fully concealed, use flexible flashing.

D. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.

E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.10 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from **neoprene**, **urethane or PVC**

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

2.11 MASONRY-CELL FILL

A. Loose-Fill Insulation: Perlite complying with ASTM C549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).

B. Lightweight-Aggregate Fill: ASTM C331/C331M.

2.12 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime masonry cement or mortar cement mortar unless otherwise indicated.
3. For exterior masonry, use portland cement-lime masonry cement or mortar cement mortar.
4. For reinforced masonry, use portland cement-lime masonry cement or mortar cement mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C270, Specification. Provide the following types of mortar for applications stated unless another type is indicated

1. For masonry below grade or in contact with earth, use Type M or Type S
2. For reinforced masonry, use Type S or Type N.
3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
4. For interior nonload-bearing partitions, Type O may be used instead of Type N.

D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

1. Mix to match Architect's sample.
2. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
   a. Decorative CMUs.
   b. Pre-faced CMUs.
   c. Cast-stone trim units.

E. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi
3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

F. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's written instructions.

1. Application: Use epoxy pointing mortar for exposed mortar joints with pre-faced CMUs.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.

3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that would impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Build chases and recesses to accommodate items specified in this and other Sections.

B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in to match existing; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube.
3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.

4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Wet joint surfaces thoroughly before applying mortar.
3. Rake out mortar joints for pointing with sealant.

D. Rake out mortar joints at pre-faced CMUs to a uniform depth of 1/4 inch and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

G. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 MASONRY-CELL FILL INSTALLATION

A. Pour lightweight-aggregate fill into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 feet.

B. Install molded-polystyrene insulation units into masonry unit cells before laying units.

3.7 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

1. Space reinforcement not more than 16 inches o.c.

2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:

1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.9 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

3.10 LINTELS

A. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.11 FLASHING

A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At lintels, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
3. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
4. Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
5. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
6. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
7. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.12 REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace,

tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.13 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements is done at Contractor's expense.

B. Inspections: Special inspections in accordance with Level B or C in TMS 402/ACI 530/ASCE 5.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Concrete Masonry Unit Test: For each type of unit provided, in accordance with ASTM C140 for compressive strength.

F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.

G. Mortar Test (Property Specification): For each mix provided, in accordance with ASTM C780. Test mortar for mortar air content and compressive strength.

H. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.

I. Prism Test: For each type of construction provided, in accordance with ASTM C1314 at 7 days and at 28 days.

3.14 PARGING

A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.

C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.15 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.16 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches in each dimension.

2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
3. Do not dispose of masonry waste as fill within 18 inches of finished grade.

C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural-steel materials.
2. Shrinkage-resistant grout.

B. Related Requirements:

1. Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" for painting requirements.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.5 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Anchor rods.
4. Threaded rods.
5. Shop primer.
6. Shrinkage-resistant grout.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
5. Identify members not to be shop primed.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide in accordance with AWS D1.1/D1.1M for each welded joint whether prequalified or qualified by testing , including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand-critical welds.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer fabricator .

B. Welding certificates.

C. Mill test reports for structural-steel materials, including chemical and physical properties.

D. Product Test Reports: For the following:

1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.

E. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

1. Welders and welding operators performing work on bottom-flange, demand-critical welds are to pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G are to be considered separate processes for welding personnel qualification.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:

1. ANSI/AISC 303.
2. ANSI/AISC 341.
3. ANSI/AISC 360.
4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:

1. Option 1: Connection designs have been completed and connections indicated on the Drawings.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M .

B. Channels, Angles, M-Shapes: ASTM A36/A36M .

C. Plate and Bar: ASTM A36/A36M .

D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.

2.4 RODS

A. Headed Anchor Rods: ASTM F1554, Grade 36 ASTM F1554, Grade 55, weldable , straight.

1. Nuts: ASTM A563 heavy-hex carbon steel.
2. Plate Washers: ASTM A36/A36M carbon steel.
3. Washers: ASTM F436, Type 1, hardened carbon steel.
4. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C .

B. Threaded Rods: ASTM A36/A36M .

1. Nuts: ASTM A63 heavy-hex carbon steel.
2. Washers: ASTM F436 , Type 1, hardened carbon steel.
3. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C .

2.5 PRIMER

A. Steel Primer:

1. Comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

2.6 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.7 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

C. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

D. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 2.

E. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.8 SHOP PRIMING

A. Shop prime steel surfaces, except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces .
6. Corrosion-resisting (weathering) steel surfaces.
7. Surfaces enclosed in interior construction.

B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 2.

C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.

1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Pretension anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: Snug tightened Pretensioned .

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 INSTALLATION OF PREFABRICATED BUILDING COLUMNS

A. Install prefabricated building columns to comply with ANSI/AISC 360, manufacturer's written recommendations, and requirements of testing and inspecting agency that apply to the fire-resistance rating indicated.

3.6 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

B. Touchup Painting:

1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

2. Cleaning and touchup painting are specified in Section 099113 "Exterior Painting." Section 099123 "Interior Painting."

C. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

3.7 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
   a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
      1) Ultrasonic Inspection: ASTM E164.

END OF SECTION 051200

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous framing and supports.
2. Prefabricated building columns.
3. Shelf angles.
4. Metal ladders.
5. Alternating tread devices.
6. Metal ships' ladders and pipe crossovers.
7. Metal floor plate.
8. Elevator pit sump covers.
9. Structural-steel door frames.
10. Miscellaneous steel trim.
11. Metal bollards.
12. Vehicular barrier cable systems.
13. Pipe and downspout guards.
14. Abrasive metal nosings, treads, and thresholds.
15. Cast-iron wheel guards.
16. Metal downspout boots.
17. Loose bearing and leveling plates.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
3. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

C. Related Requirements:

1. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
2. Section 051200 "Structural Steel Framing" for steel framing, supports, elevator machine beams, hoist beams, divider beams, door frames, and other steel items attached to the structural-steel framing.
3. Section 077200 "Roof Accessories" for manufactured metal roof walkways and metal roof stairs.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Nonslip aggregates and nonslip-aggregate surface finishes.
2. Fasteners.
3. Shop primers.
4. Shrinkage-resisting grout.
5. Prefabricated building columns.
6. Slotted channel framing.
7. Manufactured metal ladders.
8. Alternating tread devices.
9. Metal ships' ladders and pipe crossovers.
10. Metal bollards.
11. Vehicular barrier cable systems.
12. Pipe and downspout guards.
13. Abrasive metal nosings, treads, and thresholds.
14. Cast-iron wheel guards.
15. Metal downspout boots.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Miscellaneous framing and supports for applications where framing and supports are not specified in other Sections.
2. Elevator machine beams, hoist beams, and divider beams.
3. Steel shapes for supporting elevator door sills.
4. Steel girders for supporting wood frame construction.
5. Steel pipe columns for supporting wood frame construction.
6. Prefabricated building columns.
7. Shelf angles.
8. Metal ladders.
9. Alternating tread devices.
10. Metal ships' ladders and pipe crossovers.
11. Metal floor plate and supports.
12. Elevator pit sump covers.
13. Structural-steel door frames.
14. Miscellaneous steel trim including steel angle corner guards and steel edgings.

15. Metal bollards.
16. Loose steel lintels.
17. Vehicular barrier cable systems.

C. Samples for Verification: For each type and finish of extruded nosing and tread.

D. Delegated Design Submittals: For ladders, alternating tread devices, and vehicular barrier cable systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Research Reports: For post-installed anchors.

E. Delegated design engineer qualifications.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders, alternating tread devices, and vehicular barrier cable systems.

B. Structural Performance of Aluminum Ladders: Ladders , including landings, are to withstand the effects of loads and stresses within limits and under conditions specified in ANSI/ASC A14.3.

C. Structural Performance of Alternating Tread Devices: Alternating tread devices are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft..
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Alternating Tread Device Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Comply with applicable railing loadings in Section 055213 "Pipe and Tube Railings."

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304 or Type 316L.

D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304 or Type 316L.

E. Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or ASTM A283/A283M, Grade C or D.

F. Rolled-Stainless Steel Floor Plate: ASTM A793.

G. Abrasive-Surface Floor Plate: Steel plate with abrasive granules rolled into surface or with abrasive material metallically bonded to steel.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. IKG.
   b. Ohio Gratings, Inc.
   c. SlipNOT Metal Safety Flooring, division of Traction Technologies Holdings, LLC.

2. Source Limitations: Obtain floor plate from single source from single manufacturer.

H. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

I. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

J. Zinc-Coated Steel Wire Rope: ASTM A741.

1. Wire Rope Fittings: Hot-dip galvanized-steel connectors with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

K. Stainless Steel Wire Rope: Wire rope manufactured from stainless steel wire complying with ASTM A492, Type 316.

1. Wire Rope Fittings: Stainless steel connectors, Type 316, with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

L. Steel Prestressing Strand: ASTM A416/A416M, Grade 270, low-relaxation, seven-wire, with 0.9-lb/sq. ft. zinc coating.

1. Steel Prestressing Strand Fittings: Hot-dip galvanized-steel anchors and connectors with capability to sustain, without failure, a load equal to minimum breaking strength of steel prestressing strand with which they are used.

M. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

1. Size of Channels: as indicated
2. Galvanized Steel: ASTM A653/A653M, commercial steel, Type B or structural steel, Grade 33, with G90 coating; 0.108-inch or 0.079-inch or 0.064-inch nominal thickness.
3. Cold-Rolled Steel: ASTM A1008/A1008M, commercial steel, Type B, structural steel, Grade 33 ; 0.0966-inch or 0.0677-inch or 0.0528-inch minimum thickness;

N. Cast Iron: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.

O. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.

P. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.

Q. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.

R. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

S. Bronze Extrusions: ASTM B455, Alloy UNS No. C38500 (extruded architectural bronze).

T. Bronze Castings: ASTM B584, Alloy UNS No. C83600 (leaded red brass) or UNS No. C84400 (leaded semired brass).

U. Nickel Silver Extrusions: ASTM B151/B151M, Alloy UNS No. C74500.

V. Nickel Silver Castings: ASTM B584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 or Type 316 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless steel fasteners for fastening
2. Provide bronze fasteners for fastening bronze.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.

D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1 or Group 2.

E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

F. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.

G. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.

H. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 or Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

I. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts,

complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

A. Shop Primers: Provide primers that comply with other specifications.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer that contains pigments that make it easily distinguishable from zinc-rich primer.

C. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.

D. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

F. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

H. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

I. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Fabricate supports for operable partitions from continuous steel beams of sizes recommended by partition manufacturer with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

D. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.

1. Provide bearing plates welded to beams where indicated.
2. Drill or punch girders and plates for field-bolted connections where indicated.
3. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches o.c.

E. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.

1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe.
2. Unless otherwise indicated, provide 1/2-inch baseplates with four 5/8-inch anchor bolts and 1/4-inch top plates.

F. Galvanize miscellaneous framing and supports where indicated.

G. Prime miscellaneous framing and supports with zinc-rich primer

2.7 PREFABRICATED BUILDING COLUMNS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Black Rock Fireproof Column, a division of United Steel.
2. Dean Lally LLC / FireTrol Columns.

B. Source Limitations: Obtain prefabricated building column from single source from single manufacturer.

C. General: Provide prefabricated building columns consisting of load-bearing structural-steel members protected by concrete fireproofing encased in an outer non-load-bearing steel shell. Fabricate connections to comply with details shown or as needed to suit type of structure indicated.

D. Fire-Resistance Ratings: Provide prefabricated building columns listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for ratings indicated, based on testing in accordance with ASTM E119.

1. Fire-Resistance Rating: as indicated

2.8 SHELF ANGLES

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.

1. Provide mitered and welded units at corners.
2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize and prime shelf angles located in exterior walls.

D. Prime shelf angles located in exterior walls with zinc-rich primer.

E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.9 METAL LADDERS

A. General:

1. Comply with ANSI A14.3
2. For elevator pit ladders, comply with ASME A17.1/CSA B44.

B. Steel Ladders:

1. Space siderails 18 inchesapart unless otherwise indicated.
2. Siderails: Continuous, 2-by-2-1/2-inchsteel flat bars, with eased edges.
3. Rungs: as indicated
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Nonslip Surfaces for Steel Ladders: Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.
    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1) IKG.
        2) SlipNOT Metal Safety Flooring, division of Traction Technologies Holdings, LLC.
7. Source Limitations: Obtain nonslip surfaces from single source from single manufacturer.
8. Provide platforms as indicated fabricated from welded or pressure-locked steel bar grating, supported by steel angles. Limit openings in gratings to no more than 1/2 inch in least dimension.
9. Support each ladder at top and bottom and not more than 60 inches>o.c. with welded or bolted steel brackets.
10. Galvanize and prime exterior ladders, including brackets.
11. Prime exterior ladders, including brackets and fasteners, with zinc-rich primer.

C. Aluminum Ladders:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Fixfast USA.
    b. Halliday Products.
    c. O'Keeffe's Inc.
    d. Precision Ladders, LLC.

e. Royalite Manufacturing, Inc.
f. Thompson Fabricating, LLC.
g. UPNOVR, Inc.

2. Source Limitations: Obtain aluminum ladders from single source from single manufacturer.
3. Space siderails 18 inches apart unless otherwise indicated.
4. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
5. Rungs: Extruded-aluminum tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed tread surfaces.
6. Fit rungs in centerline of siderails; fasten by welding or with stainless steel fasteners or brackets and aluminum rivets.
7. Provide platforms as indicated fabricated from pressure-locked aluminum bar grating or extruded-aluminum plank grating, supported by extruded-aluminum framing. Limit openings in gratings to no more than 1/2 inch in least dimension.
8. Support each ladder at top and bottom and not more than 60 inches>o.c. with welded or bolted aluminum brackets.
9. Provide minimum 72-inch- high, hinged security door with padlock hasp at foot of ladder to prevent unauthorized ladder use.

2.10 ALTERNATING TREAD DEVICES

A. Alternating Tread Devices: Fabricate alternating tread devices of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Lapeyre Stair Inc.
   b. Precision Ladders, LLC.
   c. <Insert manufacturer's name>.

2. Tread depth is not to be less than 5 inches exclusive of nosing or less than 8-1/2 inches, including the nosing, tread width is not to be less than 7 inches, and riser height is not to be more than 9-1/2 inches.
3. Tread depth is not to be less than 8-1/2 inches exclusive of nosing or less than 10-1/2 inches, including the nosing, tread width is not to be less than 7 inches, and riser height is not to be more than 8 inches.
4. Fabricate from steel or stainless steel or aluminum and assemble by welding or with stainless steel fasteners.
5. Comply with applicable railing requirements in Section 055213 "Pipe and Tube Railings."

B. Galvanize and prime exterior steel alternating tread devices, including treads, railings, brackets, and fasteners.

C. Prime exterior steel alternating tread devices, including treads, railings, brackets, and fasteners, with zinc-rich primer.

2.11 METAL SHIPS' LADDERS AND PIPE CROSSOVERS

A. Provide metal ships' ladders and pipe crossovers where indicated. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.

1. Treads are not to be less than 5 inches exclusive of nosing or less than 8-1/2 inches including the nosing, and riser height is not to be more than 9-1/2 inches.
2. Fabricate ships' ladders and pipe crossovers, including railings from steel or stainless steel or aluminum.
3. Fabricate treads and platforms from welded or pressure-locked steel bar or pressure-locked stainless steel bar or pressure-locked aluminum bar or extruded-aluminum plank grating. Limit openings in gratings to no more than 1/2 inch in least dimension.
4. Fabricate treads and platforms from rolled-steel floor or rolled-stainless steel floor or rolled-aluminum-alloy tread or abrasive-surface floor plate.
5. Comply with applicable railing requirements in Section 055213 "Pipe and Tube Railings."

B. Galvanize and prime exterior steel ships' ladders and pipe crossovers, including treads, railings, brackets, and fasteners.

C. Prime exterior steel ships' ladders and pipe crossovers, including treads, railings, brackets, and fasteners, with zinc-rich primer.

2.12 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize and prime exterior miscellaneous steel trim.

D. Prime exterior miscellaneous steel trim with zinc-rich primer.

2.13 PIPE AND DOWNSPOUT GUARDS

A. Fabricate pipe guards from 3/8-inch- thick by 12-inch- wide, steel, stainless steel, ASTM A480/A480M, No. 4 finish plate, bent to fit flat against the wall or column at both ends and to fit around pipe with 2-inch clearance between pipe and pipe guard. Drill each end for two 3/4-inch anchor bolts.

B. Galvanize and prime steel pipe downspout guards.

C. Prime steel pipe downspout guards with zinc-rich primer

2.14 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize bearing and leveling plates.

C. Prime plates with zinc-rich primer.

2.15 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches unless otherwise indicated.

C. Galvanize and prime loose steel lintels located in exterior walls.

D. Prime loose steel lintels located in exterior walls with zinc-rich primer.

2.16 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.17 GENERAL FINISH REQUIREMENTS

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.18 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.19 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

C. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installation of Bearing and Leveling Plates" Article.

1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLATION OF PREFABRICATED BUILDING COLUMNS

A. Install prefabricated building columns to comply with ANSI/AISC 360, "Specifications for Structural Steel Buildings," and with requirements applicable to listing and labeling for fire-resistance rating indicated.

3.4 INSTALLATION OF SHELF ANGLES

A. Install shelf angles as required to keep masonry level, at correct elevation, and flush with vertical plane.

3.5 INSTALLATION OF METAL LADDERS

A. Secure ladders to adjacent construction with the clip angles attached to the stringer.

B. Install brackets as required for securing of ladders welded or bolted to structural steel or built into masonry or concrete.

3.6 INSTALLATION OF ALTERNATING TREAD DEVICES

A. Secure top and bottom of alternating tread devices to construction to comply with manufacturer's written instructions.

3.7 INSTALLATION OF METAL SHIPS' LADDERS AND PIPE CROSSOVERS

A. Secure top and bottom of ships' ladders to construction to comply with manufacturer's written instructions.

B. Secure pipe crossovers to construction to comply with manufacturer's written instructions.

3.8 INSTALLATION OF MISCELLANEOUS STEEL TRIM

A. Anchor to concrete construction to comply with manufacturer's written instructions.

3.9 REPAIRS

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055000

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel railings.
2. Aluminum railings.
3. Stainless steel railings.

B. Related Requirements:

1. Section 055113 "Metal Pan Stairs" for steel tube railings associated with metal pan stairs.
2. Section 057300 "Decorative Metal Railings" for ornamental railings fabricated from pipes and tubes and guard-infill metals.
3. Section 096900 "Access Flooring" for railings included with access flooring.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Manufacturer's product lines of mechanically connected railings.
2. Expanded metal infill panels.
3. Perforated metal infill panels.
4. Woven-wire mesh infill panels.
5. Fasteners.
6. Post-installed anchors.
7. Handrail brackets.
8. Shop primer.
9. Intermediate coats and topcoats.
10. Bituminous paint.
11. Nonshrink, nonmetallic grout.
12. Anchoring cement.

13. Metal finishes.
14. Paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For products involving selection of color, texture, or design

D. Samples for Verification: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.
2. Fittings and brackets.
3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

E. Delegated Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For delegated design professional engineer

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

E. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.

F. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:
   a. Uniform load of 50 lbf/ ft. applied in any direction.
   b. Concentrated load of 200 lbf applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:
   a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
   b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.3 STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A500/A500M (cold formed) or ASTM A513/A513M, Type 5.

C. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A36/A36M.

2.4 ALUMINUM RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

C. Extruded Bars and Tubing: ASTM B221, Alloy 6063-T5/T52.

D. Extruded Structural Pipe and Round Tubing: ASTM B429/B429M, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

E. Drawn Seamless Tubing: ASTM B210/B210M, Alloy 6063-T832.

F. Plate and Sheet: ASTM B209, Alloy 6061-T6.

G. Die and Hand Forgings: ASTM B247, Alloy 6061-T6.

H. Castings: ASTM B26/B26M, Alloy A356.0-T6.

2.5 STAINLESS STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A554, Grade MT 304 or Grade MT 316L.

C. Pipe: ASTM A312/A312M, Grade TP 304 or Grade TP 316L.

D. Castings: ASTM A743/A743M, Grade CF 8 or CF 20 or Grade CF 8M or CF 3M.

E. Plate and Sheet: ASTM A240/A240M or ASTM A666, Type 304 or Type 316L.

2.6 FASTENERS

A. Fastener Materials:

1. Ungalvanized-Steel Railing Components: Plated steel fasteners complying with ASTM F1941/F1941M, Class Fe/Zn 5 for zinc coating.
2. Hot-Dip Galvanized Railing Components: Type 304 stainless steel or hot-dip zinc-coated steel fasteners complying with ASTM A153/A153M or ASTM F2329/F2329M for zinc coating.
3. Aluminum Railing Components: Type 304 or Type 316 stainless steel fasteners.
4. Stainless Steel Railing Components: Type 304 or Type 316 stainless steel fasteners.
5. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
3. Provide Phillips or tamper-resistant or square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 or Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.7 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

1. For aluminum and stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primers: Provide primers that comply with specifications

E. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

F. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

G. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

H. Intermediate Coats and Topcoats: Provide products that comply with specifications

I. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.

J. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.

K. Bituminous Paint: Cold-applied asphalt emulsion, complying with ASTM D1187/D1187M.

L. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

M. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.8 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage , but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water.

1. Provide weep holes where water may accumulate.
2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded or nonwelded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #3 welds; utilitarian appearance not subject to view, partially dressed weld with spatter removed

I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection, using an epoxy structural adhesive, if this is manufacturer's standard splicing method.

K. Form changes in direction as follows:

1. As detailed.
2. By bending to smallest radius that will not result in distortion of railing member.

L. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

M. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

N. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

P. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.

1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

Q. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

R. For removable railing posts, fabricate slip-fit sockets from stainless steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height.

1. Provide socket covers designed and fabricated to resist being dislodged.
2. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

S. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.9 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.
4. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner and as follows.

1. Comply with SSPC-SP 16.

D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, hot-dip galvanize anchors to be embedded in exterior concrete or masonry.

E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:

1. Exterior Railings: SSPC-SP 6/NACE No. 3.
2. Railings Indicated To Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
3. Railings Indicated To Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3.
4. Other Railings: SSPC-SP 3.

F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with universal shop primer unless otherwise indicated.
2. Do not apply primer to galvanized surfaces.

G. Shop-Painted Finish: Comply with specifications

1. Color: As selected by Architect from manufacturer's full range

H. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1 for shop painting. Apply at spreading rates recommended by coating manufacturer.

1. Color: As selected by Architect from manufacturer's full range.

2.10 ALUMINUM FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Mill Finish: AA-M12, nonspecular as fabricated.

C. Clear Anodic Finish: AAMA 611,

D. Color Anodic Finish: AAMA 611,

1. Color: As selected by Architect from full range of industry colors and color densities.

E. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As selected by Architect from manufacturer's full range

F. High-Performance Organic Finish, Two-Coat Polyvinylidene Fluoride (PVDF): Fluoropolymer finish complying with AAMA 2604 or AAMA 2605. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: As selected by Architect from manufacturer's full range

G. Superior Performance Organic Finish, Three-Coat Polyvinylidene Fluoride (PVDF): Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions

1. Color and Gloss: selected by Architect from manufacturer's full range.

H. Superior Performance Organic Finish, Four-Coat Polyvinylidene Fluoride (PVDF): Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare,

pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions

1. Color and Gloss: As selected by Architect from manufacturer's full range

I. Single-Coat Superior Performance FEVE Organic Finish: Single-coat fluoroethylene vinyl ether (FEVE) fluoropolymer finish, complying with AAMA 2605. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: As selected by Architect from manufacturer's full range

J. Two-Coat Superior Performance FEVE Organic Finish: Two-coat fluoroethylene vinyl ether (FEVE) fluoropolymer finish complying with AAMA 2605. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

1. Color and Gloss: As selected by Architect from manufacturer's full range

2.11 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces.
3. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Pipe and Tubing Finishes:

1. 180-Grit Polished Finish: Uniform, directionally textured finish.
2. 320-Grit Polished Finish: Oil-ground, uniform, fine, directionally textured finish.

D. Stainless Steel Sheet and Plate Finishes:

1. Directional Satin Finish: ASTM A480/A480, No. 4.
2. High-Luster Finish: ASTM A480/A480M, No. 7.
3. Mirror Finish: ASTM A480/A480M, No. 8.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

A. Use stainless steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, attached to post with setscrews.

D. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

E. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:

1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.
2. For aluminum railings, attach posts as indicated, using fittings designed and engineered for this purpose.
3. For stainless steel railings, weld flanges to post and bolt to supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit stainless steel sockets cast in concrete.

3.5 ATTACHING RAILINGS

A. Anchor railing ends to concrete and masonry with flanges connected to brackets on underside of rails connected to railing ends and anchored to wall construction with anchors and bolts.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and connected to railing ends, using nonwelded connections.

C. Attach handrails to walls with wall brackets , except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt or predrilled hole for exposed bolt anchorage.
2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.
4. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.
5. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements, using self-tapping screws of size and type required to support structural loads.
6. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

E. Install railing gates level, plumb, and secure for full opening without interference.

1. Attach hardware using tamper-resistant or concealed means.
2. Adjust hardware for smooth operation.

3.6 REPAIR

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.7 CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780/A780M.

3.8 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.
2. Wood furring.

B. Related Requirements:

1. Section 061719 "Cross-Laminated Timber" for timber decking.
2. Section 061800 "Glue-Laminated Construction" for timber beams, girders and connectors.

1.2 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

E. Timber: Lumber of 5 inches nominal size or greater in least dimension.

F. Lumber grading agencies, and abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. SPIB: The Southern Pine Inspection Bureau.
4. WCLIB: West Coast Lumber Inspection Bureau.
5. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Sustainable Design Submittals:

1. Sourcing of Raw Materials (MRc3): Recycled content
   a. Submit product data or other published information indicating total weight of product to be provided for the Project, percent of post-consumer recycled material by weight and percent of post-industrial recycled material by weight. Include material costs (excluding costs of installation).

b. Include information on USGBC's v4.1 Building Products Calculator or use Green Badger to track and document this credit.

2. Sourcing of Raw Materials (MRc3): Wood products
   a. Forest Stewardship Council (FSC): Provide letter of certification signed by vendor. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.
      1) Submit copies of invoices identifying cost of each FSC certified product on a line-item basis, vendor's FSC chain-of-custody certificate code, and verification of if the product is “FSC 100%,” “FSC Mix Credit,” or “FSC Mix [NN]%”
   b. Include information on USGBC's v4.1 Building Products Calculator or use Green Badger to track and document this credit.
3. Low Emitting Materials (EQc2): Paints and Coatings
   a. For paints and coatings applied on site and inside the weatherproofing system, submit product data or other published information verifying the VOC (Volatile Organic Compound) content is less than or equal to the allowable VOC content established by the governing standards.
   b. For paints and coatings applied on site and inside the weatherproofing system, submit product data or other published information verifying compliance with California Department of Public Health (CDPH) Standard Method v1.2-2017, using the applicable exposure scenario. Manufacturer's claims of compliance must also state the range of total VOCs after 14 days.
   c. Include information on USGBC's v4.1 Low Emitting Materials Calculator or use Green Badger to track and document this credit.
4. Low Emitting Materials (EQc2): Composite Wood
   a. Submit product data or other published information verifying the composite wood has low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins.
   b. Include information on USGBC's v4.1 Low Emitting Materials Calculator or use Green Badger to track and document this credit.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates:

1. For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

1.5 QUALITY ASSURANCE

A. Certified Wood: Provide an invoice including vendor's chain-of-custody number, product cost, and entity being invoiced.

B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 SUSTAINABLE DESIGN REQUIREMENTS

A. Sourcing of Raw Materials (MRc3), Recycled Content: Preference should be given to materials/products that have post- and/or pre-consumer recycled content by weight of total product.

B. Sourcing of Raw Materials (MRc3), Wood Products: Preference should be given to materials/products that meet the LEED requirements for FSC certified wood.

1. Applies to solid wood and wood veneer materials only.

C. Low-Emitting Materials (EQc2): Composite Wood

1. Composite wood must be documented to meet the EPA TSCA Title VI or California Air Resources Board (CARB) ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins.

2.2 WOOD PRODUCTS, GENERAL

A. Regional Materials: Give preference to wood products with recycled content manufactured within 100 miles of Project site from materials that have been recovered, as well as manufactured, within 100 miles of Project site.

1. Dimension lumber .
2. Laminated-veneer lumber.
3. Rim boards.
4. Prefabricated wood I-joists.
5. Parallel-strand lumber.

B. Certified Wood: Certify the following wood products as "FSC Pure" or "FSC Mixed Credit" in accordance with FSC STD-01-001 and FSC STD-40-004.

1. Dimension lumber .
2. Laminated-veneer lumber.
3. Parallel-strand lumber.
4. Prefabricated wood I-joists.
5. Rim boards.

C. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified

by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
4. Dress lumber, S4S, unless otherwise indicated.

D. Maximum Moisture Content of Lumber:

1. Boards: 15 percent.
2. Dimension Lumber: 15 percent unless otherwise indicated.
3. Timber. 19 percent .

E. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable design stresses, as published by manufacturer, are to meet or exceed those indicated. Manufacturer's published values are to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.3 MISCELLANEOUS LUMBER

A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:

1. Hem-fir (north); NLGA.
2. Spruce-pine-fir; NLGA.
3. Hem-fir; WCLIB or WWPA.
4. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. Concealed Boards: 15 percent maximum moisture content and the following species and grades:

1. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
2. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.4 FASTENERS

A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329 .
2. For pressure-preservative-treated wood, use stainless steel fasteners.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.5 METAL FRAMING ANCHORS

A. Allowable design loads, as published by manufacturer, are to meet or exceed those indicated . Manufacturer's published values are to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors are to be punched for fasteners adequate to withstand same loads as framing anchors.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

C. Bridging: Rigid, V-section, nailless type, 0.050 inch thick, length to suit joist size and spacing.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

D. Do not splice structural members between supports unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

F. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

H. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Sheathing joint-and-penetration treatment materials.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Wall sheathing.
2. Sheathing joint-and-penetration treatment materials.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WALL SHEATHING

A. Glass-Mat Gypsum Sheathing, Walls: ASTM C1177/C1177M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed; SAINT-GOBAIN.
b. Gold Bond Building Products, LLC provided by National Gypsum Company.
c. USG Corporation.

2. Type and Thickness: Type X, 5/8 inch thick.
3. Size: 48 by 96 inches for vertical installation.

2.2 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

2.3 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 INSTALLATION OF GYPSUM SHEATHING

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

E. Seal sheathing joints in accordance with sheathing manufacturer's written instructions.

1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

F. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing:

1. Install accessory materials in accordance with sheathing manufacturer's written instructions and details to form a seal with adjacent construction, to seal fasteners, and ensure continuity of air and water barrier.

a. Coordinate the installation of sheathing with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
b. Install transition strip on roofing membrane or base flashing, so that a minimum of 3 inches of coverage is achieved over each substrate.

2. Connect and seal sheathing material continuously to air barriers specified under other Sections as well as to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
3. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
4. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip , so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.

    a. Transition Strip: Roll firmly to enhance adhesion.
    b. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.

5. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of sheathing material with foam sealant.
6. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
7. Repair punctures, voids, and deficient lapped seams in strips and transition strips extending 6 inches beyond repaired areas in strip direction.

END OF SECTION 061600

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polyisocyanurate foam-plastic board insulation.
2. Glass-fiber blanket insulation.

B. Related Requirements:

1. Section 061600 "Sheathing" for foam-plastic board sheathing installed directly over wood or steel framing.
2. Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Polyisocyanurate foam-plastic board insulation.
2. Glass-fiber blanket insulation.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

B. Thermal-Resistance Value (R-Value): R-value as indicated on Drawings in accordance with ASTM C518.

2.2 POLYISOCYANURATE FOAM-PLASTIC BOARD INSULATION

A. Polyisocyanurate Board Insulation, Foil Faced: ASTM C1289, foil faced, Type I, Class 1 or 2.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hunter Panels; a Carlisle company.
b. Johns Manville; a Berkshire Hathaway company.
c. Rmax, A Business Unit of Sika Corporation.

2.3 GLASS-FIBER BLANKET INSULATION

A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed; SAINT-GOBAIN.
b. Johns Manville; a Berkshire Hathaway company.
c. Owens Corning.

2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Install insulation with manufacturer's R-value label exposed after insulation is installed.

D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
5. For wood-framed construction, install blankets in accordance with ASTM C1320 and as follows:

    a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

6. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings and seal each continuous area of insulation to ensure airtight installation.
    a. Exterior Walls: Set units with facing placed toward exterior of construction.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Building paper.
2. Building wrap.
3. Drainage wrap.
4. Flexible flashing.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Building paper.
2. Building wrap.
3. Drainage wrap.
4. Flexible flashing.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.

B. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Dow Chemical Company (The).
b. DuPont Safety and Construction.
c. Raven Industries, Inc.

2. Water-Vapor Permeance: Not less than 20 perms (1150 ng/Pa x s x sq. m) per ASTM E 96/E 96M, Desiccant Method (Procedure A).
3. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

C. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

SECTION 072500 – WEATHER BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

Building paper.
1. Building wrap.
2. Flexible flashing.
3. Drainage material.

1.3 ACTION SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including preparation instructions and recommendations, storage and handling requirements, and installation methods.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.

B. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Dow Chemical Company (The).
a. DuPont Safety and Construction.
b. Raven Industries, Inc.

Water-Vapor Permeance: Not less than 20 perms (1150 ng/Pa x s x sq. m) per ASTM E 96/E 96M, Desiccant Method (Procedure A).
2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

C. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.2 FLEXIBLE FLASHING

A. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. DuPont Safety and Construction.
b. GCP Applied Technologies Inc.
c. Raven Industries, Inc.

2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

2.3 DRAINAGE MATERIAL

A. Drainage Material: Product shall maintain a continuous open space between water-resistive barrier and exterior cladding to create a drainage plane and shall be used under portland cement plaster.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sto Corp; Sto DrainScreen or a comparable product by one of the following:

a. DuPont Safety and Construction.
b. Stuc-O-Flex International, Inc.
c. TYPAR.

2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

A. Cover sheathing with water-resistive barrier as follows:

1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap unless otherwise indicated.

B. Building Paper: Apply horizontally with a 2-inch (50-mm) overlap and a 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails.

C. Building Wrap: Comply with manufacturer's written instructions and warranty requirements.

1. Seal seams, edges, fasteners, and penetrations with tape.

2. Extend into jambs of openings and seal corners with tape.

3.2 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.

1. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
2. Lap flashing over water-resistive barrier at bottom and sides of openings.
3. Lap water-resistive barrier over flashing at heads of openings.

3.3 DRAINAGE MATERIAL INSTALLATION

A. Install drainage material over building wrap and flashing to comply with manufacturer's written instructions.

END OF SECTION 072500

SECTION 074213.13 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exposed-fastener, lap-seam metal wall panels.

B. Related Requirements:

1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.

1.2 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

1. Exposed-fastener, lap-seam metal wall panels.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.4 MOCKUPS

A. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings , including corner, soffits, supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.6 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.7 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Structural failures including rupturing, cracking, or puncturing.
    b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:

1. Wind Loads: As indicated on Drawings.
2. Deflection Limits: For wind loads, no greater than 1/180 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

E. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS

A. Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Corrugated-Profile, Exposed-Fastener Metal Wall Panels: Formed with alternating curved ribs spaced at 2.67 inches o.c. across width of panel.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ATAS International, Inc.
b. CENTRIA, a Nucor Brand.
c. Metal Sales Manufacturing Corporation.
d. PAC-CLAD; Petersen; a Carlisle company.

2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
3. Rib Spacing: 2.67 inches o.c.
4. Panel Coverage: 34.6 inches.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Metal Wall Panel Accessories, General: Provide complete metal wall panel assembly incorporating trim, copings, fasciae, parapet caps, soffits, sills, inside and outside corners, and miscellaneous flashings. Provide manufacturer's factory-formed clips, shims, flashings, lap tapes, and closure strips for a complete installation. Fabricate and install accessories in accordance with SMACNA Manual.

C. Extruded Trim: Manufacturer's complementary aluminum extrusions for head, jamb, sill, base, flush, reveal, inside and outside corner, endwall, and expansion joint details. Finish to match metal wall panels.

D. Mitered Corners: Structurally bonded horizontal interior and exterior trimless corners matching metal wall panel material, profile, and factory-applied finish, fabricated, and finished by metal wall panel manufacturer.

1. Welded, riveted, fastened, or field- fabricated corners do not meet the requirements of this specification.

E. Formed Flashing and Trim: Match material, thickness, and color of metal wall panel face sheets.

F. Sealants: Type recommended by metal wall panel manufacturer for application, meeting requirements of Division 07 Section "Joint Sealants."

G. Fasteners, General: Self-tapping screws, bolts, nuts, and other acceptable fasteners recommended by panel manufacturer. Where exposed fasteners cannot be avoided for miscellaneous applications, supply corrosion-resistant fasteners with heads matching color of metal wall panels by means factory-applied coating.

H. Concealed Clips: Galvanized steel, 0.06 inch/16 ga. (1.52 mm) nominal thickness, designed to allow unimpeded thermal movement of panel and configured to hold panel minimum 1/2 inch (12.7 mm) from substrate.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:

1. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

a. Color: As selected by Architect from manufacturer’s full range of standard colors.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking, and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF METAL PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13

SECTION 074293 - SOFFIT PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal soffit panels.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.3 ACTION SUBMITTALS

A. Product Data:

1. Metal soffit panels.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including rupturing, cracking, or puncturing.
   b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
   a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F , material surfaces .

2.2 METAL SOFFIT PANELS

A. Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. Flush-Profile Metal Soffit Panels: Solid panels formed with vertical panel edges and a flat pan between panel edges; with flush joint between panels.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. CENTRIA, a Nucor Brand.
   b. Metal Sales Manufacturing Corporation.

c. PAC-CLAD; Petersen; a Carlisle company.

2. Aluminum Sheet: Coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

a. Thickness: 0.040 inch.
b. Surface: Smooth, flat finish.
c. Exterior Finish: Metallic fluoropolymer.
d. Color: As selected by Architect from manufacturer's full range.

3. Panel Coverage: 12 inches.
4. Panel Height: 1.0 inch.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal soffit panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable

if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Metallic Fluoropolymer: AAMA 2605. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
2. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
3. Exposed Anodized Finish:

a. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
b. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal panel manufacturer.
2. Examine sheathing to verify that sheathing joints are supported by framing or blocking, and that installation is within flatness tolerances required by metal panel manufacturer.

a. Verify that air- or water-resistive barriers been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

1. Soffit Framing: Wire tie furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 INSTALLATION OF METAL SOFFIT PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
4. Stainless Steel Panels: Use stainless steel fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling, and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074293

SECTION 076100 - SHEET METAL ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum sheet.
2. Underlayment materials.
3. Fasteners.
4. Sealant tape.
5. Elastomeric sealant.
6. Butyl sealant.

B. Related Requirements:

1. Section 076200 "Sheet Metal Flashing and Trim" for gutters downspouts fasciae and flashings that are not part of sheet metal roofing.
2. Section 077100 "Roof Specialties" for manufactured fasciae and copings that are not part of sheet metal roofing.
3. Section 077200 "Roof Accessories" for manufactured roof accessories.
4. Section 079200 "Joint Sealants" for field-applied sealants adjoining sheet metal roofing and not otherwise specified in this Section.

1.2 COORDINATION

A. Coordinate sheet metal roofing layout and seams with sizes and locations of roof curbs, equipment supports, equipment provided, and roof penetrations.

B. Coordinate sheet metal roofing installation with rain drainage work, flashing, trim, and construction of roofing substrate**,** parapets, walls, and other adjoining work to provide leakproof, secure, and noncorrosive installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Aluminum sheet.
2. Underlayment materials
3. Fasteners.
4. Sealant tape.
5. Elastomeric sealant.
6. Butyl sealant.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Include details for forming, including seams and dimensions.
3. Include details for joining and securing, including layout and spacing of fasteners, cleats, and other attachments. Include pattern of seams.
4. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, corners, flashings, and counterflashings.
5. Include details of connections to adjoining work.

C. Samples for Initial Selection: For each type of sheet metal with factory-applied finishes.

1. Include Samples of trim and accessories involving finish or color selection.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Roofing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, and other attachments.
2. Trim and Metal Closures: 12 inches long and in required profile. Include fasteners and other exposed accessories.
3. Other Accessories: 12-inch- long Samples for each type of other accessory.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, on which the following items are indicated and coordinated with each other, using input from installers of the items involved:

1. Sheet metal roofing, seam locations, and attachments.
2. Roof hatches.
3. Equipment supports, pipe supports, and penetrations.
4. Lighting fixtures and cable runs.
5. Snow guards.
6. Items mounted on roof curbs.
7. Details for penetrations.

B. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing sheet metals and accessories to include in maintenance manuals.

B. Special warranties.

1.6 QUALITY ASSURANCE

A. Sheet Metal Roofing Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal roofing similar to that required for this Project and whose products have a record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal roofing materials in contact with other materials that might cause staining, denting, or other surface damage.

1. Store sheet metal roofing materials away from uncured concrete and masonry.
2. Protect stored sheet metal roofing materials from contact with water.

B. Protect strippable protective covering on sheet metal roofing from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal roofing installation.

1.8 WARRANTY

A. Special Warranty: Warranty form at end of this Section in which Installer agrees to repair or replace components of sheet metal roofing that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including, but not limited to, rupturing, cracking, or puncturing.
b. Wrinkling or buckling.
c. Loose parts.
d. Failure to remain weathertight, including uncontrolled water leakage.
e. Deterioration of metals, metal finishes, and other materials beyond normal weathering, including nonuniformity of color or finish.
f. Galvanic action between sheet metal roofing and dissimilar materials.

2. Warranty Period: Five years from date of Substantial Completion.

B. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal roofing that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Sheet metal roofing system, including, but not limited to, metal roof panels, cleats, anchors and fasteners, sheet metal flashing integral with sheet metal roofing,

fascia panels, trim, underlayment, and accessories, is to comply with requirements without failure due to defective manufacture, fabrication, or installation, or due to other defects in construction. Sheet metal roofing is to remain watertight.

B. Sheet Metal Roofing Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or indicated on Drawings.

C. Copper Roofing Standard: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are specified or indicated on Drawings.

2.2 ROOFING SHEET METALS

A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B209 alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Thickness: 0.040 inch unless otherwise indicated.
2. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil.
3. Color: As selected by Architect from manufacturer's full range.

2.3 UNDERLAYMENT MATERIALS

A. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F; and complying with physical requirements of ASTM D226/D226M for Type I and Type II felts.

B. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer in accordance with written recommendations of underlayment manufacturer.

1. <Click here to find, evaluate, and insert list of manufacturers and products.>
2. Thermal Stability: ASTM D1970/D1970M; stable after testing at 240 deg F or higher.
3. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F or lower.

C. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

D. Ventilation Mat: 0.40-inch thick, three-dimensional nylon mat.

MISCELLANEOUS MATERIALS

E. Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete roofing system and as recommended by primary sheet metal manufacturer unless otherwise indicated.

F. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. General:

a. Exposed Fasteners: Heads matching color of sheet metal roofing, using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of roofing.
b. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed; with hex-washer head.
c. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.

2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
4. Fasteners for Copper, Zinc-Tin Alloy-Coated Copper, or Copper-Clad Stainless Steel Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
5. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
6. Fasteners for Zinc Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
7. Fasteners for Titanium Sheet: Titanium or Series 300 stainless steel.

G. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

H. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polysulfide silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal roofing and remain watertight.

I. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

J. Underlayment Adhesive:

1. Cold-Applied Asphalt Adhesive: ASTM D3019, Type III, asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive, specially formulated for compatibility and use with underlayment.
2. Cold-Applied Polymer-Modified Asphalt Adhesive: Underlayment manufacturer's standard solvent-and asbestos-free, cold-applied adhesive, specially formulated for compatibility and use with underlayment.

2.4 ACCESSORIES

A. Sheet Metal Accessories: Provide components required for complete sheet metal roofing assembly, including trim, fasciae, corner units, clips, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items. Match material and finish of sheet metal roofing unless otherwise indicated.

1. Expansion-Type Cleats: Cleats of a design that allows longitudinal movement of roof panels without stressing panel seams; of same material as other cleats.
2. Backing Plates: Plates at roofing splices, fabricated from material recommended by SMACNA's "Architectural Sheet Metal Manual."
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible-closure strips; cut or premolded to match sheet metal roofing profile. Provide closure strips where necessary to ensure weathertight construction.
4. Flashing and Trim: Formed from same material and with same finish as sheet metal roofing, minimum 0.018 inch thick.

2.5 FABRICATION

A. Custom-Fabricated Sheet Metal Roofing: Comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions (panel width and seam height), geometry, metal thickness, and other characteristics of installation. Fabricate sheet metal roofing and accessories in shop to greatest extent possible.

B. Flat-Seam Sheet Metal Roofing: Form flat-seam panels from metal sheets 20 by 28 inches with 1/2-inch notched and folded edges.

C. Fabrication Tolerances: Fabricate sheet metal roofing that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

D. Form exposed sheet metal work to fit substrates with little oil canning; free of buckling and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

1. Lay out sheet metal roofing, so transverse seams, if required, are made in direction of flow, with higher panels overlapping lower panels.
2. Offset transverse seams from each other 12 inches inches minimum.
3. Fold and cleat eaves and transverse seams in shop.
4. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements indicated on Drawings and as required for leakproof construction.

E. Expansion Provisions: Fabricate sheet metal roofing to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

F. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant in accordance with SMACNA's "Architectural Sheet Metal Manual."

G. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item required. Obtain field measurements for accurate fit before shop fabrication.

1. Form exposed sheet metal accessories without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
2. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices of sizes recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

H. Do not use graphite pencils to mark metal surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking, that tops of fasteners are flush with surface, and that installation is within flatness tolerances required for finished roofing installation.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provision has been made for drainage, flashings, and penetrations through sheet metal roofing.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating sheet metal roofing to verify actual locations of penetrations relative to seam locations of sheet metal roofing before installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Lay out panel arrangement, and screw battens to metal deck before installation of sheet metal roofing.

1. Space fasteners not more than 18 inches o.c.

3.3 INSTALLATION OF UNDERLAYMENT

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal roofing.

1. Install in shingle fashion to shed water, with lapped joints of not less than 4 inches.
2. Apply from eave to ridge.
3. Apply on roof not covered by self-adhering sheet underlayment.

B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, in accordance with manufacturers' written instructions, using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

1. Apply from eave to ridge.
2. Apply on roof not covered by self-adhering sheet underlayment.
3. Lap horizontal joints not less than 4 inches.
4. Lap end joints not less than 12 inches.

C. Self-Adhering High-Temperature Sheet Underlayment:

1. Install self-adhering high-temperature sheet underlayment, wrinkle free.
2. Prime substrate if recommended by underlayment manufacturer.
3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses.
5. Overlap side edges not less than 3-1/2 inches.
6. Roll laps and edges with roller.
7. Cover underlayment within 14 days of installation.
8. Install self-adhering high-temperature underlayment at the following locations:

a. Over entire roof.

3.4 INSTALLATION, GENERAL

A. Install sheet metal roofing to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to installation characteristics required unless otherwise indicated on Drawings.

1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required for complete roofing system.

2. Install sheet metal roofing true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of sealant.
3. Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Do not field cut sheet metal roofing by torch.
5. Provide metal closures at peaks rake edges rake walls eaves each side of ridge caps.
6. Flash and seal sheet metal roofing with closure strips at eaves, rakes, and perimeter of all openings. Fasten with self-tapping screws.
7. Locate and space fastenings in uniform vertical and horizontal alignment. Predrill panels for fasteners.
8. Lap metal flashing over sheet metal roofing to direct moisture to run over and off roofing.
9. Do not use graphite pencils to mark metal surfaces.

B. Thermal Movement: Rigidly fasten metal roof panels to structure at only one location for each panel.

1. Allow remainder of panel to move freely for thermal expansion and contraction.
2. Point of Fixity: Fasten each panel along a single common line of fixing located at eave center of panel length.
3. Avoid attaching accessories through roof panels in manner that inhibits thermal movement.

C. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

D. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended in SMACNA's "Architectural Sheet Metal Manual."

1. Coat concealed side of uncoated-aluminum and stainless steel sheet metal roofing with bituminous coating where roofing contacts wood, ferrous metal, or cementitious construction.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Fasciae:

1. Align bottom of sheet metal roofing and fasten with blind rivets, bolts, or self-tapping screws.
2. Flash and seal sheet metal roofing with closure strips where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.5 INSTALLATION OF CUSTOM-FABRICATED SHEET METAL ROOFING

A. Install sheet metal roofing system with lines and corners of exposed units true and accurate.

1. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks, considering metal temper and reflectivity.
2. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
3. Fold back sheet metal to form hem on concealed side of exposed edges unless otherwise indicated.

B. Install cleats to hold sheet metal roofing panels in position.

1. Attach each cleat with at least two fasteners to prevent rotation.
2. Space cleats not more than 12 inches o.c.
3. Bend tabs over fastener head.
4. Provide expansion-type cleats for roof panels that exceed 30 feet in length.

C. Seal joints as required for watertight construction. For roofing with 3:12 slopes or less, use cleats at transverse seams.

1. Use sealant-filled joints unless otherwise indicated.

a. Embed hooked flanges of joint members not less than 1 inch into sealant.
b. Form joints to completely conceal sealant.
c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
d. Adjust setting proportionately for installation at higher ambient temperatures.
e. Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.

1. Pre-tin edges of sheets with solder to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
2. Do not solder aluminum sheet.
3. Do not use torches for soldering.
4. Heat surfaces to receive solder, and flow solder into joint.

a. Fill joint completely.
b. Completely remove flux and spatter from exposed surfaces.

E. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

F. Flat-Seam Roofing:

1. Attach flat-seam metal panels to substrate with cleats, starting at eave and working upward toward ridge.
2. After panels are in place, mallet seams tight and solder.
3. Attach roofing panels with cleats spaced not more than 24 inches o.c. Lock and solder panels to base flashing.
4. Attach edge flashing to face of roof edge with continuous cleat fastened to roof substrate at 12-inch o.c. spacing. Lock panels to edge flashing and apply sealant.

3.6 INSTALLATION OF ACCESSORIES

A. Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion.

1. Coordinate installation with flashings and other components.
2. Install components required for complete sheet metal roofing assembly, including trim, seam covers, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items.
3. Install accessories integral to sheet metal roofing that are specified in Section 076200 "Sheet Metal Flashing and Trim" to comply with that Section's requirements.

B. Flashing and Trim: Comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual."

1. Provide concealed fasteners where possible, and install units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
3. Install flashing and trim as required to seal against weather and to provide finished appearance, including, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
4. Install continuous strip of self-adhering underlayment at edge of continuous flashing overlapping self-adhering underlayment, where "continuous seal strip" is indicated in SMACNA's "Architectural Sheet Metal Manual" and on Drawings.
5. Install exposed flashing and trim without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
6. Install sheet metal flashing and trim to fit substrates, and to result in waterproof and weather-resistant performance.
7. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

    a. Space expansion joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
    b. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, and filled with butyl sealant concealed within joints.
    c. Use lapped expansion joints only where indicated on Drawings.

3.7 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal roofing within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. On completion of sheet metal roofing installation, clean finished surfaces as recommended by sheet metal roofing manufacturer.

C. Clean and neutralize flux materials. Clean off excess solder.

D. Clean off excess sealants.

3.9 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal roofing is installed unless otherwise indicated in manufacturer's written installation instructions.

B. Prohibit traffic of any kind on installed sheet metal roofing.

C. Maintain sheet metal roofing in clean condition during construction.

D. Replace sheet metal roofing components that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076100

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof sheet metal fabrications.
2. Wall sheet metal fabrications.
3. Miscellaneous sheet metal fabrications.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.

1.2 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Low-slope roof sheet metal fabrications.
2. Wall sheet metal fabrications.
3. Miscellaneous sheet metal fabrications.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.

9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.

D. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

1.4 INFORMATIONAL SUBMITTALS

1.5 CLOSEOUT SUBMITTALS

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested [and FM Approvals approved], shop is to be listed as able to fabricate required details as tested and approved.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
2. Protect stored sheet metal flashing and trim from contact with water.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.8 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

D. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Exposed Coil-Coated Finish:

    a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

2. Color: As selected by Architect from manufacturer's full range.
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
    c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Copper, Zinc-Tin Alloy-Coated Copper, or Copper-Clad Stainless Steel Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
4. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
5. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
6. Fasteners for Zinc Sheet: Series 300 stainless steel [or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M].

C. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

D. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.

1. Source Limitations: Obtain reglets from single source from single manufacturer.
2. Material: Stainless steel, 0.0188 inch thick, Aluminum, 0.024 inch thick, Galvanized steel, 0.022 inch thick.
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
5. Accessories:
   a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
6. Finish: With manufacturer's standard color coating.

2.4 FABRICATION, GENERAL

A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.

1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
3. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

H. Do not use graphite pencils to mark metal surfaces.

2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Expansion-Joint Cover: Shop fabricate interior and exterior corners. Fabricate roof, roof-to-wall transition, roof-to-roof edge-flashing, and fascia-cap transition expansion-joint cover from the following materials:

1. Aluminum: 0.050 inch thick.

B. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Aluminum: 0.040 inch thick.

C. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Aluminum: 0.032 inch thick.

D. Flashing Receivers: Fabricate from the following materials:

1. Aluminum: 0.032 inch Insert dimension.

2.6 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high, end dams. Fabricate from the following materials:

1. Aluminum: 0.032 inch thick.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.

1. Install fasteners protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of sealant.
3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
8. Do not field cut sheet metal flashing and trim by torch.
9. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
3. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated.
   a. Embed hooked flanges of joint members not less than 1 inch into sealant.
   b. Form joints to completely conceal sealant.
   c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
   d. Adjust setting proportionately for installation at higher ambient temperatures.

      1) Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 INSTALLATION OF ROOF FLASHINGS

A. Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless steel draw band and tighten.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
2. Extend counterflashing 4 inches over base flashing.
3. Lap counterflashing joints minimum of 4 inches.
4. Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant spaced at 12 inches o.c. along perimeter and 6 inches o.c. at corners areas unless otherwise indicated.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 INSTALLATION OF WALL FLASHINGS

A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.5 INSTALLATION OF MISCELLANEOUS FLASHING

3.6 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

3.8 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.

C. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Penetration firestopping systems.

1.2 ACTION SUBMITTALS

A. Product Data: Penetration firestopping systems.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines. Obtain approval of authorities having jurisdiction prior to submittal.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval Standard for Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain penetration firestop systems for each type of opening indicated from single manufacturer.

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems are to be compatible with one another, with the substrates forming openings, and with penetrating items if any.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. 3M Building and Construction.
   b. Balco; a CSW Industrials Company.
   c. Hilti, Inc.
   d. NUCO Inc.

B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.

1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.

C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.

1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.

D. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

1. Permanent forming/damming/backing materials.
2. Substrate primers.
3. Collars.
4. Steel sleeves.

2.3 MIXING

A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

C. Install fill materials by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.

1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.

B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Designation of applicable testing and inspecting agency.
3. Date of installation.
4. Manufacturer's name.

3.5 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Silicone joint sealants.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.

1.5 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Adfast.
b. GE Construction Sealants; Momentive Performance Materials Inc.
c. Sika Corporation - Building Components.

2.3 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Adfast.
b. Alcot Plastics Ltd.
c. Construction Foam Products; a division of Nomaco, Inc.
d. Master Builders Solutions, brand of MBCC Group, a Sika company.

B. Cylindrical Sealant Backings: ASTM C1330, or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.4 MISCELLANEOUS MATERIALS

A. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

B. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Concrete.
   b. Masonry.
   c. .
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.

b. .

B. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants in accordance with requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior standard steel doors and frames.

B. Related Requirements:

1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Exterior standard steel doors and frames.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.

6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
7. Details of anchorages, joints, field splices, and connections.
8. Details of accessories.
9. Details of moldings, removable stops, and glazing.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of thermally rated door assemblies for tests performed by a qualified testing agency indicating compliance with performance requirements.

1.7 CLOSEOUT SUBMITTALS

1.8 QUALITY ASSURANCE

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door; AADG, Inc.; ASSA ABLOY.
2. Curries, AADG, Inc.; ASSA ABLOY Group.
3. Republic Doors and Frames; a Allegion brand.
4. Steelcraft; Allegion plc.

2.2 PERFORMANCE REQUIREMENTS

A. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.40 deg Btu/F x h x sq. ft. when tested in accordance with ASTM C1363 or ASTM E1423.

2.3 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A.

1. Doors:
   a. Type: As indicated in the Door and Frame Schedule on Drawings.
   b. Thickness: 1-3/4 inches.
   c. Edge Bevel: Provide manufacturer's standard beveled or square edges.
   d. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
   e. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
   f. Core: Vertical steel stiffener.

2. Frames:
   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
   b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.4 HOLLOW-METAL PANELS

A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.6 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

G. Glazing: Comply with requirements in Section 088000 "Glazing."

2.7 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

B. Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, complying with ANSI/SDI A250.3.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
   a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
   b. Install frames with removable stops located on secure side of opening.

2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.

   a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.

3.3 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:

a. "Metal Doors and Frames"
b. "Flush Wood Doors"
c. "Stile and Rail Wood Doors"
d. "Interior Aluminum Doors and Frames"
e. "Aluminum-Framed Entrances and Storefronts"
f. "Stainless Steel Doors and Frames"
g. "Special Function Doors"
h. "Entrances"

6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies

3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:

a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:

a. Wiring Diagrams: For power, signal, and control wiring and including:

1) Details of interface of electrified door hardware and building safety and security systems.
2) Schematic diagram of systems that interface with electrified door hardware.
3) Point-to-point wiring.
4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

   a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule:

   a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
   b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
   c. Indicate complete designations of each item required for each opening, include:
      1) Door Index: door number, heading number, and Architect's hardware set number.
      2) Quantity, type, style, function, size, and finish of each hardware item.
      3) Name and manufacturer of each item.
      4) Fastenings and other pertinent information.
      5) Location of each hardware set cross-referenced to indications on Drawings.
      6) Explanation of all abbreviations, symbols, and codes contained in schedule.
      7) Mounting locations for hardware.
      8) Door and frame sizes and materials.
      9) Degree of door swing and handing.
      10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:

   a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.

e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:

a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
b. Catalog pages for each product.
c. Final approved hardware schedule edited to reflect conditions as installed.
d. Final keying schedule
e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:

a. Fire door assemblies, in compliance with NFPA 80.
b. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project’s vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:

    a. For door hardware: DHI certified AHC or DHC.
    b. Can provide installation and technical data to Architect and other related subcontractors.
    c. Can inspect and verify components are in working order upon completion of installation.
    d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:

    a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
    b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:

    a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
    b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu.m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Electrified Door Hardware

    a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

4. Accessibility Requirements:

    a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference

a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
   1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
   2) Preliminary key system schematic diagram.
   3) Requirements for key control system.
   4) Requirements for access control.
   5) Address for delivery of keys.

2. Pre-installation Conference

a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
b. Inspect and discuss preparatory work performed by other trades.
c. Inspect and discuss electrical roughing-in for electrified door hardware.
d. Review sequence of operation for each type of electrified door hardware.
e. Review required testing, inspecting, and certifying procedures.
f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:

a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

a

1.06 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.07 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.

a. Mechanical Warranty
1) Locks
a) Schlage L Series: 3 years
b) Schlage ND Series: 10 years
2) Exit Devices
a) Von Duprin: 3 years
3) Closers
a) LCN 4000 Series: 30 years

b. Electrical Warranty

1.08 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:

1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

a. Ives 5BB series

2. Acceptable Manufacturers and Products:

a. Hager BB1191/1279 series
b. McKinney TB series
c. Stanley FBB series

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. 2 inches or thicker doors:

a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
b. Interior: Heavy weight, steel, 5 inches (127 mm) high

6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

a. Steel Hinges: Steel pins
b. Non-Ferrous Hinges: Stainless steel pins
c. Out-Swinging Exterior Doors: Non-removable pins
d. Out-Swinging Interior Lockable Doors: Non-removable pins
e. Interior Non-lockable Doors: Non-rising pins

9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:

a. Ives

2. Acceptable Manufacturers:

    a. Select
    b. Stanley
    c. Roton
    d. ABH
    e. Hager

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:

    a. Von Duprin EPT-10

2. Acceptable Manufacturers and Products:

    a. No Substitute

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.06 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

    a. Schlage L9000 series

2. Acceptable Manufacturers and Products:

    a. No Substitute

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
7. Provide motor based electrified locksets that comply with the following requirements:

    a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
    b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
    c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
    d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
    e. Connections – provide quick-connect Molex system standard.

8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

    a. Lever Design: 06

2.07 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

a. Schlage ND series

2. Acceptable Manufacturers and Products:

a. No Substitute

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.

a. Lever Design: 06

2.08 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

a. Von Duprin 99/33A series

2. Acceptable Manufacturers and Products:

a. No Substitute

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide grooved touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.

9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.09 MAGNETIC LOCKS

A. Manufacturers:

1. Scheduled Manufacturer:

a. Schlage

2. Acceptable Manufacturers:

a. Securitron
b. Security Door Controls

B. Requirements:

1. Provide magnetic locks certified to meet ANSI/BHMA A156.23 classification criteria, UL10C, and UL1034 for burglary-resistant electronic locking mechanisms.
2. Provide magnetic locks equipped with SPDT Magnetic Bond Sensing device, where specified, to monitor whether enough magnetic holding force exists to ensure adequate locking and SPDT Door Status Monitor device, where specified, to monitor whether door is open or closed. Provide bond sensors fully concealed within electromagnet to resist tampering or damage.
3. Provide fasteners, mounting brackets, and spacer bars required for mounting and details.
4. Provide power supply recommended and approved by manufacturer of magnetic locks.
5. Where magnetic locks are scheduled, provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of magnetic locks for each individual leaf. Switches control both doors simultaneously at pairs. Locate controls as directed by Architect.

2.10 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

    a. Schlage/Von Duprin PS900 Series

2. Acceptable Manufacturers and Products:

    a. Dynalock 5000 series
    b. Securitron BPS series
    c. Security Door Controls 600 series

B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:

    a. 12/24 VDC Output, field selectable.
    b. Class 2 Rated power limited output.
    c. Universal 120-240 VAC input.
    d. Low voltage DC, regulated and filtered.
    e. Polarized connector for distribution boards.
    f. Fused primary input.
    g. AC input and DC output monitoring circuit w/LED indicators.
    h. Cover mounted AC Input indication.
    i. Tested and certified to meet UL294.
    j. NEMA 1 enclosure.
    k. Hinged cover w/lock down screws.
    l. High voltage protective cover.

2.11 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

    a. Schlage Everest 29/ Primus XP – CONFIRM WITH OWNER

2. Acceptable Manufacturers and Products:

    a. No Substitute

B. Requirements:

1. Provide cylinders/cores, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.

2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.

    a. High Security: dual-locking cylinder with permanent core requiring restricted, patented keyway. Dual-locking mechanism with interlocking finger pin(s) to check for patented features on keys.

3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

2.12 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:

    a. LCN 4040XP series

2. Acceptable Manufacturers and Products:

    a. No Substitute

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.13 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:

a. Ives

2. Acceptable Manufacturers:

a. Burns
b. Trimco
c. Rockwood

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.14 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:

a. Glynn-Johnson

2. Acceptable Manufacturers:

a. Rixson
b. Sargent
c. ABH

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

2.15 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:

a. Ives

2. Acceptable Manufacturers:

a. Trimco
b. Burns
c. Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.16 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:

a. Zero International

2. Acceptable Manufacturers:

a. National Guard
b. Reese
c. Legacy
d. Pemko

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.17 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:

a. Ives

2. Acceptable Manufacturers:

a. Burns
b. Rockwood
c. Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.18 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as indicated in keying section.
3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Connections to panel interface modules, controllers, and gateways.
6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
M. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.
B. Clean operating items per manufacturer's instructions to restore proper function and finish.
C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
D. Hardware Sets

Hardware Group No. 01

For use on each Single Door #(s):
101L

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	224XY EPT 628 IVE			628	IVE
1	EA	POWER TRANSFER	EPT10			689	VON
1	EA	OH STOP	90S (J BRACKET AS REQ)			630	GLY
1	EA	CORE/CYLINDER	AS DIRECTED BY OWNER			626	
1	EA	SURFACE CLOSER	4040XP SCUSH TBWMS			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	RAIN DRIP	142AA			AA	ZER
1	SET	GASKETING	429AA-S			AA	ZER
1	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A			A	ZER
2	EA	CREDENTIAL READER	PROVIDED BY SECURITY CONTRACTOR				
1	EA	DOOR POSITION SWITCH	PROVIDED BY SECURITY CONTRACTOR				
1	EA	LOW VOLTAGE POWER	PROVIDED BY SECURITY CONTRACTOR				
1	EA	ELEC PANIC HARDWARE	LX-RX-QEL-9927-DT-LBR VDC VDC	24		626	VON

Hardware Group No. 02 -

For use on each Pair of Door #(s):
101F 101G 101H 101J

2	EA	CONT. HINGE	224XY EPT	628	IVE
2	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-PA-9847-EO	630	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-PA-9847-L-NL-06 24 VDC	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	CYLINDER	UL 437 CYLINDER (VERIFY WITH MED OWNER)		
2	EA	SURFACE CLOSER 4 LDW B-CS	040XP EDA MC 689 LCN 2 EA KICK PLATE 8400 10" X 1"	630	IVE
1	EA	OH STOP	90S(J BRACKET AS REQ)	630	GLY
2	EA	FLOOR	STOP FS18S	BLK	IVE
1	SET	MEETING STILE	328AA-S AA ZER OR BY HMD MFR.		
1	EA	GASKETING	188SBK BLK ZER 2 EA DOOR SWEEP 39A A ZER		
1	EA	THRESHOLD PER DETAIL			

CARD READER (BOTH SIDES), POWER SUPPLY, DOOR CONTACTS, AND LOCAL ALARM (VERIFY IF SECURITY WANTS INTEGRATED INTO DEVICES), FURNISHED BY DIVISION 28 CARD READER ON EGRESS SIDE TO SHUNT ALARM WHEN CREDENTIAL IS PRESENTED. IF EXIT DEVICES ARE USED TO EXIT WITHOUT PRESENTING A CREDENTIAL ALARM WILL SOUND. FREE EGRESS PROVIDED AT ALL TIMES

Hardware Group No. 03

For use on Door #(s):
101K

Provide each SGL door(s) with the following:

DOOR HARDWARE BY MANUFACTURER. PROVIDE HIGH SECURITY PADLOCK WITH PROTECTED SHACKLE AND CHANGEABLE COMBINATION. PROVIDE INTERIOR HEAVY DUTY STRIP CURTAIN.

END OF SECTION 0871000

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SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

B. Related Requirements:

1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
2. Section 079219 "Acoustical Joint Sealants" for acoustical joint sealants installed in gypsum board assemblies.
3. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Gypsum board, Type X.
2. Abuse-resistant gypsum board.
3. Interior trim.

1.3 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated in accordance with ASTM E119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C1396/C1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum.
b. CertainTeed; SAINT-GOBAIN.
c. Georgia-Pacific Gypsum LLC.
d. USG Corporation.

2. Thickness: 5/8 inch.
3. Long Edges: Tapered.

B. Abuse-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested in accordance with ASTM C1629/C1629M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum.
b. CertainTeed; SAINT-GOBAIN.
c. Georgia-Pacific Gypsum LLC.
d. USG Corporation.

2. Core: 5/8 inch, Type X.
3. Surface Abrasion: ASTM C1629/C1629M, meets or exceeds requirements.
4. Indentation: ASTM C1629/C1629M, meets or exceeds requirements.
5. Soft-Body Impact: ASTM C1629/C1629M, meets or exceeds requirements.
6. Long Edges: Tapered.
7. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:

a. LC-Bead: J-shaped; exposed long flange receives joint compound.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

A. Comply with ASTM C840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: As indicated on Drawings.
2. Abuse-Resistant Type: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
   b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints in accordance with ASTM C840 and in specific locations approved by Architect for visual effect.

3.5 FINISHING OF GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and in accordance with ASTM C840:

1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Primers.
2. Finish coatings.

B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates.
2. Section 055000 "Metal Fabrications" for shop priming metal fabrications.
3. Section 055213 "Pipe and Tube Railings" for shop priming pipe and tube railings.
4. Section 099600 "High-Performance Coatings" for tilelike coatings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include preparation requirements and application instructions.
2. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.
2. Sherwin-Williams Company (The).

B. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another, and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.3 PRIMERS

A. Exterior, Alkali-Resistant, Water-Based Primer: Pigmented, water-based primer formulated for use on alkaline surfaces, such as exterior plaster, vertical concrete, and masonry.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

B. Water-Based Bonding Primer: Pigmented, water-based-emulsion primer formulated for exterior use and to promote adhesion of subsequent specified coatings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

C. Water-Based, Galvanized-Metal Primer: Corrosion-resistant, pigmented, acrylic primer; formulated for use on cleaned/etched, exterior, galvanized metal to prepare it for subsequent water-based coatings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2.4 FINISH COATINGS

A. Exterior, Water-Based, Light Industrial Coating, Semigloss: Corrosion-resistant, water-based, pigmented, emulsion coating formulated for resistance to blocking (sticking of two painted surfaces), water, alkalis, moderate abrasion, and mild chemical exposure and for use on exterior, primed, wood and metal surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2. Gloss Level: Manufacturer's standard semigloss finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Fiber-Cement Board: 12 percent.

3. Wood: 15 percent.

C. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

G. Aluminum Substrates: Remove loose surface oxidation.

H. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 INSTALLATION

A. Apply paints in accordance with manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

3. Paint exterior side and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in the Exterior Painting Schedule may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.

B. Tint undercoats same color as topcoat but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Uninsulated metal piping
b. Metal conduit
c. .

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
3. Allow empty paint cans to dry before disposal.
4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Non-Structural Steel and Iron Substrates:

1. Water-Based, Light Industrial Coating System:

a. Prime Coat: Zinc-rich, inorganic primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

B. Galvanized-Metal Substrates:

1. Water-Based, Light Industrial Coating System:

a. Prime Coat: Water-based, galvanized-metal primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Primers.
2. Water-based finish coatings.
3. Dry fall coatings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include preparation requirements and application instructions.

B. Samples: For each type of topcoat product.

C. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

1.4 QUALITY ASSURANCE

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.
2. PPG Paints; PPG Industries, Inc.
3. Sherwin-Williams Company (The).

B. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.3 PRIMERS

A. Interior Latex Primer Sealer: Water-based latex sealer used on new interior plaster, concrete, and gypsum wallboard surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2.4 WATER-BASED FINISH COATS

A. Interior, Latex, Flat: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed wood and metals.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2. Gloss and Sheen Level: Manufacturer's standard flat finish.

B. Interior, Latex, Eggshell: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed wood and metals.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2. Gloss and Sheen Level: Manufacturer's standard eggshell finish.

C. Interior, Latex, Semigloss: Pigmented, water-based paint for use on primed/sealed interior plaster and gypsum board, and on primed wood and metals.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2. Gloss Level: Manufacturer's standard semigloss finish.

2.5 DRY FALL COATINGS

A. Dry Fall, Latex, Flat: Pigmented, water-based, emulsion-type, fast-drying coating for use on interior plaster, concrete, gypsum board, primed wood, and metal ceilings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.
c. Sherwin-Williams Company (The).

2. Gloss and Sheen Level: Manufacturer's standard flat finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Fiber-Cement Board: 12 percent.
3. Masonry (Clay and CMUs): 12 percent.
4. Wood: 15 percent.
5. Gypsum Board: 12 percent.
6. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Plaster Substrates: Verify that plaster is fully cured.

E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 INSTALLATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms:
   a. Uninsulated metal piping.
   b. Metal conduit.
   c. .

2. Paint the following work where exposed in occupied spaces:
   a. Uninsulated metal piping.
   b. Metal conduit.
   c. Other items as directed by Architect.
   d. .

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
3. Allow empty paint cans to dry before disposal.
4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

A. CMU Substrates:

1. Latex System:

a. Block Filler: Interior/exterior latex block filler.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior, latex, flat eggshell semigloss.

B. Galvanized-Metal Substrates:

1. Latex System:
a. Prime Coat:
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior, latex, flat eggshell semigloss.

C. Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. Latex System:
a. Prime Coat: Quick-dry primer for aluminum.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior, latex, flat eggshell semigloss.

D. Exposed Wood Framing:

1. Latex over Latex Primer System:
a. Prime Coat: Interior latex primer for wood.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior, latex, flat eggshell semigloss.

E. Gypsum Board Substrates:

1. Latex over Latex Sealer System:
a. Prime Coat: Interior latex primer sealer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior, latex, flat eggshell semigloss.

END OF SECTION 099123

SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:

1. Exterior Substrates:
   a. Steel.

2. Interior Substrates:
   a. Concrete, horizontal surfaces.

1.2 DEFINITIONS

A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

B. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

C. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product indicated.

C. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches square.
2. Apply coats on Samples in steps to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Coatings: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Benjamin Moore & Co.
2. PPG Paints; PPG Industries, Inc.
3. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in the Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for the coating category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
3. Products shall be of same manufacturer for each coat in a coating system.

C. Colors: As selected by Architect from manufacturer's full range.

2.3 SOURCE QUALITY CONTROL

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

1. Clean surfaces with pressurized water. Use pressure range of 1500 to 4000 psi at 6 to 12 inches.
2. Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 11.

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for coating and substrate indicated.
2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

C. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.5 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:

1. Epoxy System MPI EXT 5.1F:
   a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.
   b. Intermediate Coat: Epoxy, high build, low gloss, MPI #108.
   c. Topcoat: Epoxy, gloss, MPI #77.

3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Concrete Substrates, Horizontal Surfaces.

1. Epoxy System MPI INT 3.2C:
   a. Prime Coat: Epoxy, matching topcoat.
   b. Intermediate Coat: Epoxy, matching topcoat.
   c. Topcoat: Epoxy, gloss, MPI #77.

END OF SECTION 099600

SECTION 102616 - BUMPER GUARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Work Includes: Supply and installation of modular, energy-absorbing polymer safety barriers including rails, posts, anchors, accessories, and related hardware.

B. Application Areas: Baggage handling halls, airside logistics lanes, apron perimeters, terminal operations, and other mixed pedestrian/vehicular zones.

C. System Suitability: New construction and retrofit projects within international-airport facilities.

1.2 REFERENCES

A. PAS 13:2017 – Code of Practice for Safety Barriers in Industrial Workplaces.

B. OSHA 29 CFR 1910 – General Industry Standards.

C. ASTM D256, D638, D790 – Impact, Tensile, and Flexural Properties of Plastics.

D. ASTM E84 – Surface Burning Characteristics of Building Materials.

E. ISO 4892-3 – Plastics – Methods of Exposure to Laboratory Light Sources – Fluorescent UV Lamps.

F. ISO/TS 10358 – Plastics – Chemical-Resistance Classification.

G. ISO 9001 and ISO 14001 – Quality and Environmental Management Systems.

1.3 SUBMITTALS

A. Product Data: Polymer formulations, mechanical properties, dynamic-impact test reports, chemical-resistance data, fire classification, and environmental declarations.

B. Shop Drawings: Barrier layouts, post spacing, anchorage details, and clearances.

C. Certificates: Third-party verification of dynamic-impact performance in accordance with PAS 13.

D. Quality Documentation: Manufacturer ISO 9001 and ISO 14001 certificates; evidence of minimum ten years manufacturing experience with industrial polymer barriers.

E. Manuals: Installation instructions, operation and maintenance (O&M) manuals, and recommended inspection schedules.

1.4 QUALITY ASSURANCE

A. Testing: Dynamic-impact tests witnessed and certified by an independent, accredited laboratory.

B. Installer Qualifications: Installer shall be trained by manufacturer and shall have completed at least three projects of similar scope in airport or comparable heavy-traffic environments.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver barrier components in manufacturer's original packaging, clearly labelled for identification.

B. Store components indoors, elevated above floor, protected from direct sunlight, extreme temperatures, and petroleum-based chemicals until installation.

1.6 WARRANTY

A. Provide manufacturers' standard one-year warranty covering materials.

B. Extended Warranty: Offer option to extend to three years when Owner participates in manufacturer's recommended installation program.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Polymer safety-barrier system meeting the requirements of this Section.

B. Substitution Requests: Submit in accordance with Division 01; products must demonstrate full compliance with all performance criteria herein no later than ten business days prior to bid.

2.2 MATERIALS

A. Rails and Posts: Copolymer elastomer blend; density ≤ 1.0 g/cm³; Shore-D 60-70; self-extinguishing (ASTM E84 Class A).

B. Couplings: Engineered polymer joints designed to control deflection and return barrier to original alignment following design impact.

C. Baseplates: Zinc-nickel–plated carbon-steel or stainless-steel plates providing ≥ 2 000 h salt-spray resistance per ISO 9227.

D. Fasteners: AISI 316 stainless-steel or zinc-nickel class 10.9 bolts and anchors, sized per manufacturer's calculations.

E. Color: High-visibility safety yellow, RAL 1003, unless noted otherwise on Drawings; pigmentation homogeneous through section.

F. Recyclability: Polymer components shall be 100 % recyclable at end of service life.

2.3 COMPONENTS

A. Barrier Rails: Single, double, or triple-rail modules, and available in lengths up to 2400mm.

B. Posts: Square or circular cross-section, available in heights from 300 mm to 1200 mm; post design shall permit individual replacement without disturbing adjacent anchors.

C. Anchors: Torque-controlled mechanical anchors or injectable adhesive studs sized to suit substrate thickness and design loads.

D. Accessories: Gates, removable sections, corner modules, column protection, signage brackets, and end-of-run bollards supplied by same manufacturer.

2.4 2.4 PERFORMANCE REQUIREMENTS

A. Dynamic-Impact Resistance: Not less than 20 kJ at 90° impact angle without post fracture or anchor failure, tested in accordance with PAS 13 Annex C.

B. Permanent Deflection: Maximum 3 % of original height 60 minutes after design impact.

C. Operating Temperature Range: −10 °C to +50 °C without loss of mechanical performance.

D. Chemical Resistance: Rated “Excellent” to aviation fuels, hydraulic fluids, de-icing chemicals, road salts, and common acids and alkalis per ISO/TS 10358.

E. UV Stability: Color change $\Delta E \leq 3$ after 1000 hours exposure using ISO 4892-3 cycle 1.

F. Surface Resistivity: $10^{10} – 10^{12}$ Ω to dissipate static charge in fuel-handling areas.

2.5 2.5 FABRICATION

A. Manufacture components to dimensions and tolerances indicated on Shop Drawings; form rails and posts in continuous molding process without welded seams.

B. Finish: Provide smooth, uniform surfaces free from burrs, voids, or sharp edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. A. Verify site conditions and substrate strength; concrete compressive strength shall be ≥ 25 MPa and slab thickness ≥ 150 mm unless alternative anchoring design is submitted.

B. Confirm installation locations and clearances with Owner’s representative prior to drilling.

3.2 PREPARATION

A. Clean substrate to remove dust, debris, and contaminants; locate and mark all embedded services.

B. Where required, perform ground-penetrating-radar scan to avoid reinforcement conflicts.

3.3 INSTALLATION

A. Install barrier system in strict accordance with manufacturer's printed instructions and approved Shop Drawings.

B. Drill anchor holes to specified diameter and depth; install anchors using manufacturer-recommended torque values.

C. Set rails level within ±3 mm and plumb posts within ±2 mm; provide expansion gap of 5 mm per 10 m run for thermal movement.

3.4 FIELD QUALITY CONTROL

A. Inspection: Verify anchor torque, rail alignment, post spacing, and clearance envelopes; document results on manufacturer's inspection checklist.

B. Anchor Proof Testing: Perform pull tests on 2 % of total anchors, minimum two per project area, to 50 % of ultimate design load.

3.5 ADJUSTING AND CLEANING

A. Replace damaged or improperly installed components.

B. Clean completed installation; remove debris and packaging from site.

3.6 PROTECTION

A. Protect barrier system from construction traffic until Date of Substantial Completion

END OF SECTION 102616

SECTION 133123 - TENSILE MEMBRANE STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes an exterior architectural tensile membrane canopy structure system.

B. The tensile membrane structure contractor (hereafter referred to as “Subcontractor”) shall be responsible for the detailing, fabrication, supply, and installation of the Work specified herein, some or all of which may be subcontracted by Subcontractor to others meeting the qualification requirements of Section 1.5. The intent of this specification is to establish in the first instance an undivided, single-source responsibility of the Subcontractor for all of the foregoing functions.

C. Subcontractor’s Work shall include, but not necessarily be limited to, the supply, fabrication, shipment, and erection of the following principal items:

1. The architectural membranes (Single layer PTFE-coated fiberglass and single layer ETFE film) as indicated on the drawings and in these specifications.
2. Cables and end fittings.
3. Perimeter, catenary, and sectionalized aluminum clamping system.
4. Structural steel, including columns, trusses, struts, beams, and/or weldments, as indicated on the drawings.
5. Fasteners and gasketing.

D. The architectural membranes used in these structures shall be: polytetrafluoroethylene ("PTFE," such as Teflon®) coated woven fiberglass and ethylene tetrafluoroethylene (ETFE) film. All references to "membrane" in this Section 13000, without exception, and whether singular, plural, or capitalized or not, are to such architectural membrane.

E. Related Sections:

1. Division 1: General Requirements.
2. Division 3: Concrete, for cast-in-place foundations.
3. Division 5: Metals, for structural metal framing, metal fabrications, expansion control systems, and shop-applied metal coatings.
4. Division 9: Finishes, for paints and coatings.

1.2 REFERENCES

A. General: Except as otherwise shown or noted, all Work shall comply with the requirements of the following codes and standards:

1. Building Code of ASCE 7-10, IBC 2015 (open structure) edition.
2. American Institute of Steel Construction (AISC).
   a. AISC/ANSI 360 Specification for Structural Steel Buildings
   b. AISC 303 Code of Standard Practice for Steel Buildings and Bridges

c. AISC/ANSI 341 Seismic Provisions for Structural Steel Buildings

3. American Society of Civil Engineers (ASCE).
   a. ASCE 19:Structural Applications of Steel Cables for Buildings

4. American Society for Testing and Materials (ASTM).
   a. ASTM A586:Standard Specification for Zinc-Coated Steel Structural Strand
   b. ASTM A603:Standard Specification for Zinc-Coated Steel Structural Wire Rope
   c. ASTM D4851-88:Standard Test Methods for Coated and Laminated Fabrics for Architectural Use
   d. ASTM E84:Standard Test Method for Surface Burning Characteristics of Building Materials
   e. ASTM E108:Standard Test Methods for Fire Tests of Roof Coverings
   f. ASTM E136:Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
   g. ASTM C423:Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
   h. ASTM E424:Standard Test Method for Solar Energy Transmittance and Reflectance of Sheet Materials

5. American Welding Society (AWS).
   a. AWS D1.1:Structural Welding Code
   b. AWS 2.4:Symbols for Welding and Nondestructive Testing

6. Aluminum Association.
   a. Specifications for Aluminum Structures

7. National Fire Protection Association (NFPA).
   a. NFPA 701:Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

8. Society for Protective Coatings (SSPC).
   a. Steel Structures Painting Manual, Volumes 1 and 2

1.3 SYSTEM REQUIREMENTS

A. General: Provide a structural PTFE and ETFE tensile membrane system that complies with requirements specified herein by testing the Subcontractor’s corresponding membrane system in accordance with the indicated test methods.

B. Building Code Criteria: The tensile membrane structure shall comply with the California Code of Regulations 2022.

1. Ground Snow Load:40psf
2. Snow Load Importance Factor:1.10
3. Roof Live Load20 psf
4. Ultimate Wind Speed:120 mph
5. Wind Exposure Category:C
6. Enclosure Classification:Partially Enclosed (Canopy)

C. Life Safety: All tensile membrane structures shall be detailed so that no life safety issue is created in the event of a loss of a part of the membrane. The tensile membrane structure shall not rely on the membrane for structural stability.

D. Fire Performance: Range of characteristics required of PTFE membranes:

1. Burning Characteristics (ASTM E84).
   a. Flame Spread 5 max.
   b. Smoke Generation (Tunnel Test)20 max.

2. Fire Resistance of Roof Coverings (ASTM E108).
   a. Burning Brand Class A

3. Incombustibility of Substrates (ASTM E136).
   a. Substrate Noncombustible Pass

4. Flame Resistance (NFPA 701 Small Scale, UL 94).
   a. Flame Out 1 second after
   b. Char Length0.25-inch max.

E. Fire Performance: Range of characteristics required of ETFE Film membranes:

1. Burning Characteristics (ASTM E84): Class A
2. Fire Resistance of Roof Coverings (ASTM E108).
   a. Burning Brand Class A

3. Combustion Tests for Plastics (UL 94TM): VTM-0

1.4 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Fabrication and erection of the tensile membrane structure is limited to firms with proven experience in fabrication and construction of complex tensile membrane structures. Such firms, through their own experience and/or that of their qualified subcontractors, shall meet the following minimum requirements:

1. The Fabricator/Installer shall have at least fifteen (15) years' experience in the successful fabrication and erection of permanent, custom tensile membrane structures.
2. The Fabricator/Installer shall have fabricated and erected at least fifty (50) PTFE-coated woven fiberglass and ETFE Film tensile membrane structures, with at least five (5) structures of similar size and complexity as this project.
3. The Fabricator/Installer shall design, procure, fabricate and erect PTFE-coated woven fiberglass tensile membrane and ETFE Film as a tensile membrane structure.
   a. Designer Qualifications: Professional Structural Engineer with fifteen (15) years of documented experience in design of this work and licensed in the location of the project.

4. The Fabricator/Installer shall demonstrate it owns and operates a fabrication facility of adequate capacity and will maintain a staff experienced in the fabrication of PTFE-coated woven fiberglass and ETFE film tensile membrane structures that will undertake the fabrication of this project.

5. The Fabricator/Installer shall maintain an in-house Warranty and Service department to assist in repair and service calls.
6. The Fabricator/Installer shall submit a Corporate Quality Control Manual describing the company's complete quality assurance program.

1.5 ACTION SUBMITTALS

A. General: Notwithstanding any provisions of these specifications that may appear to be to the contrary, any and all submittals by the Subcontractor shall be subject to review, approval, and adoption by the Project Engineer as part of the overall project design and engineering and shall not create a contractual or other professional design relationship between the Subcontractor and either the Project Engineer or the Owner.

B. Qualification Data: For Installer, fabricator, and design engineer.

C. Delegated-Design Submittal: For assemblies indicated to comply with performance requirements and design criteria, including analysis data and drawings signed and sealed by the qualified professional engineer responsible for their preparation including:

1. Plans, elevations, sections, mounting heights, and frame assembly details.
2. Frame member sizes and required wall thicknesses.
3. Welding requirements.
4. Details of bolted and pin connections for frame assembly.
5. Required sizes of bolts, pins, plates, and tubing.
6. Verify the fabric meets minimum engineering requirements.
7. Details fabric attachment methods and identify thickness of all membrane plates, clamps, and other attachment components.
8. Cable sizes and pretension requirements.
9. Anchor-bolt plans before foundation work begins. Include location, diameter, and projection of anchor bolts required to attach the tensioned fabric structures to foundation. Indicate column reactions at each location.

D. Product Data: Include manufacturer's specifications for materials, fabrication, installation, and recommendations for maintenance. Include test reports showing compliance with project requirements where test method is indicated.

1. Samples: Submit selection and verification samples.

E. Shop Drawings: Subcontractor shall submit tensile membrane structure drawings defining the completed structure, anchorage and connection details, interfaces with building construction, and general membrane seam arrangements.

F. Quality Assurance Submittals.

1. Test Reports: Provide test reports from a qualified testing laboratory that show compliance of the Subcontractor's PTFE-coated woven fiberglass and ETFE Film tensile membrane system with specification requirements, as follows:
   a. Physical test data of the actual fabric roll goods to be used in the project confirming conformance with specifications for the membrane.

2. Certificates: Product certificates signed by the Subcontractor certifying materials comply with specified characteristics, criteria, and physical requirements.

G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, attachment methods, and perimeter conditions requiring special attention.

1.6 CLOSEOUT SUBMITTALS

A. Warranty: Project Warranty documents as described herein.

B. Record Documents: Project record documents for installed materials in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

C. Maintenance Manual: Submit two (2) copies of a maintenance manual for the tensile membrane structure to the Owner. The manual shall include a schedule for routine inspection, an inspection checklist, instructions for emergency repair and use of emergency repair materials, and warranty. During the system erection period, the Owner shall provide maintenance personnel to be trained in the use of the repair materials.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. General: Refer to the Conditions of the Contract for product handling provisions.

B. Materials shall be packed, loaded, shipped, unloaded, stored, and protected in a manner that will avoid abuse, damage, and defacement.

1.8 WARRANTY

A. General: Refer to the Conditions of the Contract for project warranty provisions.

B. After final payment, the Subcontractor shall furnish the Owner with a written Warranty, which warrants that the membrane, its perimeter attachment system, and the structural support system as supplied by the Subcontractor have been installed in accordance with the project specifications and will be free from defects in materials and workmanship that will impair their normal use or service. The Warranty shall start from the date of Substantial Completion of the tensile membrane structure, which shall be the first date on which the entire tensile membrane structure is subject to design prestress conditions and continue for a period of three (3) years thereafter.

PART 2 - PRODUCTS

2.1 FABRICATORS/INSTALLERS

A. Design is based on tensile membrane structure designed, engineered, fabricated, and installed by the following:

1. Birdair, Inc.

2. Contact: Michele R. Taylor
3. 6461 Main Street, Amherst, New York 14221 USA
4. Phone (716) 870-2236 Fax (716) 633-9850
5. MicheleT@Birdair.com
6. Web Site www.birdair.com

2.2 ARICHTECTURAL MEMBRANES

A. General: The membranes used in these structures shall be polytetrafluoroethylene ("PTFE," such as Teflon®) coated woven fiberglass and ethylenetetrafluoroethylene (ETFE) film. All references to "membrane" in this Section 13000, without exception, and whether singular, plural, or capitalized or not, are to such architectural membrane.

B. The membranes shall meet the following general requirements:

1. Source Quality Control: The primary materials shall be obtained from a single manufacturer. Secondary materials shall be those recommended by the primary manufacturer.
2. Physical Characteristics: The following indicates a range of physical properties typical of PTFE Architectural Membranes. The determination of specific characteristics and selection of a membrane shall be derived from project engineering by the Project Engineer.
    a. Coated Fabric Weight (oz./sq. yd.):24 min. to 45.5 nom. (ASTM 4851)
    b. Thickness (mils): 18 min. to 36 nom. (ASTM 4851)
    c. Strip Tensile (lbs./in., avg.):
        1) Dry, Warp 520 min. to 975 min. avg. (ASTM 4851)
        2) Dry, Fill 380 min. to 900 min. avg. (ASTM 4851)
    d. Strip Tensile, After Crease Fold
    e. (lbs./in., avg.):
        1) Dry, Warp 375 min. to 760 min. avg. (ASTM 4851)
        2) Dry, Fill 350 min. to 735 min. avg. (ASTM 4851)
    f. Trapezoidal Tear (lbs./in., avg.):
        1) Warp35 min. to 95 min. avg. (ASTM 4851)
        2) Fill 35 min. to 120 min. avg. (ASTM 4851)
    g. Solar Transmission (%): 7 to 22 nom. (ASTM E424)
    h. Solar Reflectance (%): 70 to 73 nom. (ASTM E424)

3. Physical Characteristics: The following indicates a range of physical properties typical of ETFE Architectural Film. The determination of specific characteristics and selection of a membrane shall be derived from project engineering by the Project Engineer.
    a. Specific Gravity:1.70 – 1.76 (ASTM D792)
    b. Thickness (mils):0.5 - 20. (ASTM 4851)
    c. Print
        1) The overall printing area shall be xx%
        2) The Light transmission through the printed film shall be xx%
    d. Solar Transmission of clear film:90%(ASTM E424)
    e. Refractive Index:1.4% (ASTM D542)
    f. Water absorption:<0.03% (24 hrs)

4. Fire Performance of ETFE Architectural Film:

5. 10 Mil
6. (250 Micron)Test Method
    a. VTM – 0UL 94VTM
    b. Class AASTM E84
    c. Class AASTM E108
    d. B-s1, d0DIN EN 13501-1

C. Materials.

1. PTFE Base Fabric: The yarns used shall be of the highest commercial quality, essentially free of broken fibers and fully suitable for coating. The fabric shall be woven with uniform tension and crimp in the warp and fill yarns and free of defects deleterious to the coating process.
2. Fluorocarbon Coatings: The coating materials shall be fluorocarbon resins formulated specifically for architectural applications. These materials shall be applied to form a weatherized barrier between the fiberglass yarns and the environment. The bulk of the coating shall be formulated dispersions of PTFE fluoropolymer resin and additives to enhance abrasion and tear resistance, impart pigmentation, or modify solar transmission. The additives shall not constitute more than 20% by weight of the total coating or 25% by weight of any individual layer. The surface shall be totally a fluoroethylenepropylene (“FEP”) resin to facilitate heat welding.
3. After weaving, the base fabric shall be cleaned and primed to achieve optimum mechanical properties of the coated membrane. The coating, described above, shall be virtually free of mud cracks and pinholes. The coating shall be applied evenly to both sides of the fabric and the FEP fluorocarbon resin topcoat shall be of sufficient thickness to permit proper heat fusion of joints with the recommended die pressure and temperature.

2.3 CABLES AND END FITTINGS

A. Materials.

1. All structural wire rope cables shall conform to the latest revision of ASTM A603.
2. All structural strand cables shall conform to the latest revision of ASTM A586.
3. All cables shall be coated to “Class A” zinc coating throughout.
4. All cables in contact with the PTFE membrane shall be white PVC coated. All other cables may be galvanized only.
5. Reinforcement cable for the single layer ETFE system shall be made of stainless steel, AISI 304 or AISI 316

B. Fabrication.

1. Cable fabricator shall provide effective quality control over all fabrication activities. Inspection of the place of fabrication may occur at any time to verify proper quality control. This inspection does not relieve the fabricator from meeting the requirements of this specification.
2. Cables that are designated to be prestretched shall be prestretched per ASTM A603 for wire rope and ASTM A586 for structural strand. Cables of the same type shall have the same modulus of elasticity.

3. All cables shall be manufactured to the following length tolerances at 70 degrees Fahrenheit (23 degrees Celsius):
   a. Length < 70 feet (213 meters)¼ inch (6.4 mm)
   b. Length 70 to 270 feet (32.3 to 82.3 meters)0.03% of length
   c. Length > 270 feet (82.3 meters)1 inch (25.4 mm)

4. Cables shall have a continuous longitudinal paint stripe (¼ inch wide max.) along their top surface unless noted otherwise.
5. Index markings shown shall be a circumferential paint stripe (¼ inch wide max.).
6. All cables and end fittings shall be delivered clean and dry.
7. All swaged and speltered fittings shall be designed and attached to develop the full breaking strength of the cable. Thimble end fittings shall develop a minimum of 90% of the cable breaking strength.
8. Swaged end fittings, pins, nuts, and washers shall be hot dip galvanized per ASTM A153. Any damage to the zinc coating shall be cleaned and painted with a gray zinc-rich paint per ASTM A780.
9. Speltered end fittings shall be hot dip galvanized per ASTM A153. Any damage to the zinc coating shall be cleaned and painted with a gray zinc-rich paint per ASTM A780.

2.4 ALUMINUM CLAMPING SYSTEM

A. Materials.

1. All structural aluminum clamping systems shall be ASTM alloy 6061-T6.
2. Bent plates shall be formed from ASTM alloy 6061 and then heat-treated to T6.
3. All structural “U straps” shall be stainless steel, Type 316.
4. All structural aluminum clamping shall have the following finish:
   a. Polyester thermosetting powder coating with a tri-glycidyl isocyanurate (i.e. TGIC) curing agent/hardener per American Architectural Manufacturers Association (AAMA) 2603 to a thickness of 3 mils, white in color.

5. Structural sheet aluminum shall be ASTM alloy 5052-H32.
6. Non-structural sheet aluminum shall be ASTM alloy 1100 series.
7. Shall include bird wire deterrent system made of stainless-steel grade 304.

B. Fabrication.

1. Aluminum fabricator shall provide effective quality control over all fabrication activities. Inspection of the place of fabrication may occur at any time to verify proper quality control. This inspection does not relieve the fabricator from meeting the requirements of this specification.
2. Fabricated aluminum shall have no sharp edges.
3. Stamp all parts with the appropriate mark number.
4. All fabricated aluminum shall be free of oil, grease, and machining chips.
5. Tolerances shall be as follows:
   a. Cross sectional dimensions+/- 10%, 0.03-inch (0.8 mm) max.
   b. Bolt hole locations+/- 1/32 inch (0.8 mm)
   c. Overall length+/- 1/16 inch (1.6 mm)

6. All welded joints shall conform to AWS D1.2.

2.5 STRUCTURAL STEEL

A. General: The structural steel fabrication shall comply with the latest revision of all applicable codes, standards, and regulations including the following:

1. ASTM (as referenced).
2. AISC: “Specification for Structural Steel Buildings” and “Code of Standard Practice for Steel Buildings and Bridges.”
3. SSPC: “Steel Structures Painting Manual, Volumes 1 and 2.”
4. Research Council on Riveted and Bolted Structural Joints: “Specification for Structural Joints Using ASTM A325 or A490 Bolts.”
5. AWS D1.1 and AWS A2.4.

B. In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.

C. Submittals.

1. General: Submit the following in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
2. Shop Drawings.
   a. The structural steel fabricator shall submit shop drawings to the Subcontractor for approval.
   b. The drawings shall show all shop and erection details including cuts, copes, connection holes, threaded fasteners, bolts, studs and spacing, etc.
   c. The drawings shall show all welds, both shop and field, by the currently recommended symbols of the AWS.
   d. A welding procedure must be submitted to the Subcontractor for approval of welds that are not prequalified.
   e. Shop drawings shall be carefully checked before being submitted for approval and shall be submitted in the order in which they are needed for the execution of the work, well in advance and not all at one time. Submitted drawings shall show all structural steel required for the work, whether or not indicated on the drawings.
   f. The fabricator shall not fabricate any material until after receipt of approved drawings.
   g. The fabricator shall immediately make all corrections to his drawings as required by the Subcontractor and shall keep a satisfactory history of all changes by separately numbered and dated revision block on a convenient portion of each drawing affected.
   h. Certification of material conformance that includes chemical and physical properties for all structural elements shall be submitted to the Subcontractor.

D. Materials.

1. All architecturally exposed structural steel shall comply with AISC Standard Steel Fabrication and not be above AESS level 2.
2. Structural steel for plates and bars shall conform to the requirements of ASTM A36 or ASTM A572, Grade 50, unless noted otherwise.
3. Structural pipe shall conform to ASTM A53, Types E or S, Grade B.
4. Structural tubing shall conform to ASTM A500 Grade B.
5. Structural bolts.

a. High strength bolts:ASTM A325, unless noted otherwise.
b. Common bolts and nuts:ASTM A307.
c. Threaded rods:ASTM A36, unless noted otherwise.

6. Other materials: All other materials, not specifically described but required for a complete and proper installation of structural steel, shall be provided and shall be new, free from rust, first quality of their respective kinds, and subject to the approval of the Subcontractor.

E. Accessories.

1. Base Plates and Anchor Bolts.
   a. Base plates supported on concrete, whether shop attached or shipped loose, shall be furnished, and set on shims, leveling plates or leveling nuts. Grouting shall be by the General Contractor.
   b. Anchor bolt locations shall be furnished by the Subcontractor and used by the General Contractor to set the bolts. The General Contractor is to carefully check the setting of the bolts to their proper position prior to placing of concrete. Anchor bolts, provided by the General Contractor, shall have two (2) nuts and washers. Damaged threads shall be repaired or be cut to permit full tightening of nuts.

F. Fabrication.

1. Workmanship: All members, when finished, shall be true and free of twists, bends, and open joints between the component parts. Members shall be thoroughly straightened in the shop by methods that will not injure them, before being worked on in any way.
   a. Properly mark materials, and match-mark when directed by the Subcontractor, for field assembly.
   b. Grind all edges and corners that could contact membrane to a minimum 1/16” (1.6mm) radius.

2. Connections.
   a. Connections shall be as indicated on the drawings. When details are not shown, the connections shall conform to the requirements of the AISC.
   b. Provide high strength threaded fasteners for all structural steel bolted connections, unless noted otherwise.
   c. Combination of bolts and welds in the same connection are not permitted, unless otherwise detailed.
   d. Welded Connections.
      1) Definitions: All terms herein relating to the welds, welding and oxygen cutting shall be construed in accordance with the latest revision of “Standard Definitions of Welding Terms and Master Chart of Welding Processes” of the AWS.
      2) Operators: Welds shall be made only by operators who have been previously qualified by tests, as prescribed in AWS D1.1 to perform the type of work required.
      3) Welding equipment shall be of sufficient capacity and maintained in good working condition, capable of adjustment in full range of current settings. Welding cables shall be adequate size for the currents involved and grounding methods shall be such as to insure proper machine operation.

4) No welding shall begin until joint elements are clamped in proper alignment and adjusted to dimensions shown on the drawings with allowance for any weld shrinkage that is expected. No members are to be spliced without prior approval.
5) All welding shall be done in accordance with the reference specifications, with the following modifications and additions:
   a) All field welding shall be done by manual shielded metal-arc welding.
   b) All groove welds shall have complete penetration, unless otherwise specified on the drawings.
   c) The minimum preheat and interpass temperature requirements shall be as required per AWS D1.1.
6) Welding Sequence: Heavy sections and those having a high degree of restraint must be welded in a sequence with the proper preheat and post-weld heat treatment such that no permanent distortion occurs. Submit a welding sequence for approval for these types of connections.
7) Oxygen Cutting: Manual oxygen cutting shall be done only with a mechanically guided torch. Alternatively, an unguided torch may be used provided the cut is not within 1/2 inch of the finished dimension and the final removal is completed by chipping or grinding to produce a surface quality equal to that of the base metal edges. The use of oxygen-cut holes for bolted connections or pin connections will under no circumstances be permitted, and violation of this clause will be sufficient cause for the rejection of any pieces in which oxygen-cut holes exist.

3. Tolerances: All tolerances shall be as per the AISC "Code of Standard Practice for Steel Buildings and Bridges" unless otherwise indicated. Limit variation in straightness to (member length)/960 measured in any direction for all members.
4. Paint System, Two-Coat; Zinc Polyurethane:
   a. Source Quality Control: Primary materials shall be obtained from a single manufacturer. Secondary materials shall be those recommended by the primary manufacturer.
   b. Surface Preparation and Prime Coat:
      1) Surface preparation shall be commercial blast cleaning SSPC-SP-6, after all fabrication operations such as machining and welding are complete. There shall be a maximum of eight hours elapsed time between surface preparation and application of the prime coat.
      2) Protect all drilled and tapped holes and/or threaded studs prior to painting such that all bolted connections can be made by subcontractor or membrane structure erector without first cleaning threads.
      3) Primer shall be International Paint Interzinc 315 or approved equal and shall comply with the composition and performance requirements of SSPC paint specification No. 20.
      4) Primer shall be mixed and applied in accordance with manufacturer's instruction and technical product datasheets. The dry film thickness shall be 2.5-3 mils.
   c. Finish Coat:
      1) Finish coat shall be International Paint Interthane 870 series or approved equal and shall comply with the composition and performance requirements of SSPC paint specification No. 36.

2) Finish coat shall be mixed and applied in accordance with manufacturer's instructions and technical product datasheets. The dry film thickness shall be 4-5 mils.
3) Total system dry film thickness shall be 6.5-8 mils.

d. Color:
1) The paint color shall be as specified on the drawings or selected by the Architect.

e. Finish Quality:
1) Dry paint shall be uniform and continuous with no voids or puddles and shall not be broken by scratches or nicks. Although Birdair or the steel fabricator may witness the painting operation, this does not relieve the painting subcontractor of the responsibility for meeting the quality and workmanship requirements of this specification.

f. Care and Handling:
1) Painting subcontractor shall make every reasonable effort to ensure the painted steel is thoroughly dry and it is handles carefully to prevent aesthetic or structural damage. Nylon slings shall be used when handling painted steel.

g. Certification:
1) Painting Subcontractor shall certify the paint manufacturer's name, paint identification, conformance with manufacturer's written instructions, and the paint dry mil thickness.

G. Source Quality Control.

1. Testing.
a. An independent testing laboratory paid for by the Owner shall perform testing and inspection of the structural steel and welding. All welds shall be tested by visual, dye penetrant, magnetic particle methods, or ultrasonic methods in accordance with instructions from the Subcontractor.
b. The Subcontractor and the testing laboratory inspector shall be permitted to inspect the work in the shop or field throughout fabrication and erection.
c. The inspector shall check for workmanship of steel, both in the shop and field, and check general compliance with the Contract Documents and steel shop drawings. The inspector shall record types and locations of all defects found in the work and measures required and performed to correct such defects.
d. The steel fabricator shall make all repairs to defective work to the satisfaction of the inspector and at no additional cost to the Subcontractor.
e. The inspector shall submit reports of his inspection and test findings to the Subcontractor. He shall record all defects found with subsequent repair operations and submit reports to the Subcontractor.
f. The work of the independent inspector shall in no way relieve the steel fabricator of his responsibility to comply with all requirements of the Contract Documents.

H. Product Handling and Protection: Use all means necessary to protect structural steel before, during, and after installation and to protect the installed work and materials of all other trades.

I. Rejection and Replacement.

1. In the event of damage to the steel, immediately make all repairs and replacements necessary to the approval of and at no additional cost to the Subcontractor.

2. Any materials or welding rejected through inspection either in the shop, mill or field must be promptly replaced to the satisfaction of, and at no additional cost to, the Subcontractor.

J. Qualifications of Steel Fabricator: The steel fabricator shall have not less than five (5) years' continuous experience in the fabrication of structural steel.

2.6 FASTENERS

A. General: Provide fasteners used to secure clamp systems to curbs and cables, assemblage of clamp systems, and other fasteners as required to complete the work specified herein.

B. Materials.

1. All work shall comply with the latest edition of ASTM standards and American Iron and Steel Institute (AISI), as referenced herein.
2. Fasteners used in membrane clamping systems shall be stainless steel. Bolts and studs shall conform to ASTM F593, Type 304. Nuts shall conform to ASTM F594, Type 316. Washers shall be plain, narrow, and conform to AISI Type 18-8.
3. All clamping systems subjected to relative movement between clamping and curb shall receive a split-ring lock washer conforming to AISI Type 18-8.
4. Unless otherwise specified on the drawings, all other bolts and nuts shall conform to ASTM A307-76B, zinc plated to conform to ASTM B633 Class Fe/Zn 8 type III.

C. Source Quality Control: The manufacturer shall certify that all fasteners comply with the above referenced specifications.

2.7 GASKETING

A. General: All work shall comply with the latest edition of ASTM standards, as referenced herein.

B. Sponge Neoprene Gasketing:

1. Material.
   a. All sponge neoprene shall be of a cellular elastomeric compound of a firm grade, which has been manufactured in pre-formed shapes for use as gasket and sealing material, as specified in ASTM specification C509.
   b. Cellular elastomeric materials furnished to this specification shall be manufactured from natural or synthetic rubber, or mixtures of these, with added compounds of such nature and quality that, with proper curing, the finished product will comply with this specification.
   c. The cured compounds shall be suitable for use where resistance to sunlight, weathering oxidation, and permanent deformation under load are of prime importance.
   d. The manufacturing process shall be such as will ensure a homogeneous cellular material free of defects that may affect serviceability.
   e. The physical characteristics of the neoprene must meet or exceed ASTM C509, "Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Materials."

f. Certification of material shall be provided that conforms to ASTM C509.

C. Dense Neoprene Gasketing (PTFE Structures):

1. All neoprene material shall conform to ASTM D 2000M hardness Grade 60. The material shall be homogenous, free from defects and shall be compounded and cured to meet the requirements specified herein.
2. All neoprene shall be non-staining formulation and shall consist of at least 50% by weight of basic rubber hydrocarbon. Material shall not contain crude or reclaimed rubber.
3. The physical characteristics of the neoprene must meet or exceed the following physical test requirements when tested using the standard ASTM test slab can compression set plug (or approved equal):
   a. Shore A DurometerD 224055 – 65
   b. Tensile Strength (Min.)D 4121,100 PSI
   c. Percent Elongation (Min.)D 412300%
   d. Percent Compression Set (Max.)D 395, Method B,35%
   e. Heat Aging, Change fromD 573, 70 hrs @ 212°F
      1) Hardness Change (Max.)+15 Points Shore A
      2) Tensile Strength (Max.)-15%
      3) Elongation Change (Max.)-40%
   f. Flame ResistanceMust Not
   g. Temperature Range-30°C to 100°C
   h. Ozone ResistanceD 1171, Method A,
   i. Resistance to Oil Aging:D 471, 70 hrs @ 212°F
      1) Tensile Strength (Max.)-70%
      2) Elongation (Max.)-55%
      3) Volume Change (Max.)+120%

D. EPDM Gasketing (ETFE Film Structures):

1. All EPDM Material shall be of a grade which has been manufactured for use as gasket and sealing material.
2. The cured compounds shall be suitable for use where resistance to sunlight and weathering oxidation are of prime importance.
3. The manufacturing process shall be such as will ensure a material free of defects that may affect serviceability.
4. The physical characteristics must meet or exceed the following physical test requirements when tested using the latest standard ASTM test slab can compression set plug (or approved equal):
   a. Shore A DurometerD 224060 – 70
   b. Tensile Strength (Min.)D 4121,305 psi
   c. Percent Elongation (Min.)D 412350%
   d. Tear Resistance (min.)D 624175 lbs./in
   e. Resistance to Heat Aging:D 573
   f. Ozone ResistanceD 1149no cracks
   g. Low temp. brittlenessD 746-75 F
   h. Water absorption (Max)D 4714%
   i. Water Vapor permeabilityE 962.0 (Max)
   j. Ultra Violet Weathering:
   k. Sheet CompositionD 29730% Min

2.8 PTFE & ETFE MAINTENANCE KIT

A. Architectural Membrane Maintenance Kit: The Owner shall be supplied with the following materials for emergency repair or maintenance. The materials shall be neatly packaged into a maintenance kit for storage by the Owner.

B. QUANTITYDESCRIPTION

1. 612-inch diameter patch with FEP sheets
2. 125-inch diameter patch with FEP sheets
3. 124-inch x 8-inch rectangular patch with FEP sheets
4. 6 sq ydsOuter Membrane
5. 200 ftFEP tape, 3 inches wide
6. 1Soldering iron, 500W with wedge tip
7. 1Tacking sealer, 3-inch x 5-inch die
8. 2Insulating bearing blocks
9. 15/8 in. hole punch
10. 1Utility knife
11. 50Repair clips
12. 1Spool of No. 36 nylon twine
13. 36 yds Cormar B29/4 x 15 Kevlar® thread
14. 1Hand awl
15. 1 pkg C-29 needles
16. 1PTFE Repair manual
17. 6 sq ydsETFE film
18. 2 rollsETFE tape
19. 1ETFE Repair manual

PART 3 - EXECUTION

3.1 FABRICATION OF MEMBRANE PANELS

A. General.

1. Membrane assembly shop drawings shall include all information necessary for the fabrication by the Subcontractor of the tensile membrane structure. They shall include size and shape of envelope, type and location of shop and field connections, size, type, and extent of all heat-welded seams.
2. The Subcontractor shall take necessary care to plan and assemble the fabricated sections such that the assembly has no shop patches. Splices, if any, shall be patterned into a symmetrical and repetitive geometric arrangement within the assembly, shown on the shop drawings and, where feasible, hidden by structural members.
3. All fabricated joints shall have a minimum of 90% of the total strength of the coated membrane in strip tensile testing. All structural joints shall be fused in accordance with industry standards and shall maintain the integrity of the coating.
4. Biaxial Test: At least one (1) representative sample of the outer membranes (PTFE and ETFE Film) shall be biaxially test loaded. Membrane compensation in patterning shall be based upon the results of the biaxial test loading.

3.2 ERECTION OF MEMBRANE ASSEMBLIES

A. Prior to installation of the PTFE and ETFE single layer membrane assemblies, the Subcontractor shall meet with the General Contractor to review the erection procedure and scheduling. The Subcontractor shall coordinate all work with other trades.

B. No trade shall have access to, or work from the PTFE membrane and/or ETFE Film, unless authorized by the Subcontractor in writing.

C. Weather conditions: The Subcontractor shall proceed with installation of the tensioned membrane and associated Work only when existing and forecast weather conditions permit Work to be performed in accordance with established procedures and an appropriate degree of safety. The Subcontractor shall proceed only when willing to guarantee the Work as required without additional reservations or restrictions. All mutual decisions or agreements to proceed with the Work under unfavorable weather conditions must be recorded in writing stating the reasons for proceeding and the name of the person or persons involved in the decision. Under no condition will the Subcontractor be required to erect in weather conditions not approved by them.

D. Patching and repairs:

1. Installation of the canopy fabric shall be made with due care and appropriate protection to limit abrasion, cuts, and tears.
2. Small damaged areas, maximum dimension in any direction 4 in., in the roof fabric shall be patched. No more than one field patch in 2000 sq. ft. shall be allowed, and no more than one field patch per panel, and no more than 5 field patches in the entire Work shall be allowed.
3. All field patches shall be executed to achieve 100% of the virgin PTFE coated membrane's strength properties.
4. All PTFE patches shall be circular. All ETFE patches shall be rounded corners.

E. Erection of Structural Steel (or other structural supporting elements).

1. The Subcontractor shall employ a competent foreman to supervise all work of steel erection. This foreman shall be present at all times during the Subcontractor’s scope of work.
2. All precautions shall be taken to ensure an accurately located and completely safe and stable structure at all times. Adequate guy cables shall be used throughout the work and all erection bolts shall be drawn up tight.
3. All steel shall be accurately aligned before permanent connections are made.
4. Temporary bracing shall be left in place as long as may be required for safety. The bracing shall be located so it does not interfere with the erection of the tensile membrane structure and can be removed as required during construction.
    a. The structure is to be self-supporting and stable after the building is fully completed. It is the Subcontractor’s sole responsibility to determine the erection procedure and sequence and to ensure the safety of the building and its component parts during erection. This includes the addition of whatever temporary bracing, guys or tie-downs that may be necessary. Such materials shall be removed by the Subcontractor and remain his property after completion of the project.

5. Erection tolerances shall be specified in the AISC "Code of Standard Practice for Steel Buildings and Bridges," including those related to placement of anchor bolts, unless otherwise indicated.
    a. Tensile membrane structures (including individual membrane panels) are pre-engineered and prefabricated to fit a specific theoretical dimension. For those primary and secondary structural elements to which the membrane structure (including an individual membrane panel) is connected, the erected position of member working points, including those of cantilevered members, shall not vary from the theoretical model by more than 1" (25mm) in any direction, either individually, or cumulatively across a shipping piece. This includes but is not limited to cable connection points, membrane panel edges, membrane bearing locations, intermediate splice points of field-spliced members, hardware connections, weldments and their anchorages. For arched members, include the three-dimensional location of the member midpoint as a working point for tolerance measurement.
    b. The cumulative effect of dimensional steel discrepancies shall be such that the distance between membrane panel support points does not vary more than 1" (25mm) from the theoretical dimension within each membrane panel.
    c. All steel structures that support tensioned membrane must maintain an uninterrupted drainage path and a minimum constant slope of 5 degrees from all points of the membrane.
    d. In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.

3.3 PROTECTION AND CLEANING

A. Protect work from damage and deterioration during installation.

B. Upon completion of PTFE and ETFE tensile membrane structure installation:

1. The Subcontractor shall clean all surfaces of the system's components in conformance with the membrane manufacturer's recommendations.
2. Inspect the system and repair membrane panels that have become damaged. Repairs shall be executed in such a way that they are visually acceptable.

C. Further protection of the work and final cleaning, if necessary, shall be the responsibility of the General Contractor.

END OF SECTION 133123

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section includes:

1. Sleeves without waterstop.
2. Sleeves with waterstop.
3. Grout.
4. Silicone sealants.
5. Escutcheons.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of product, excluding motors which are included in Part 1 of the fire-suppression equipment Sections.
   a. Include construction details, material descriptions, and dimensions of components.
   b. Include operating characteristics and furnished accessories.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 COORDINATION

PART 2 - PRODUCTS

2.1 SLEEVES AND SLEEVE SEALS

A. Sleeves without Waterstop:

1. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, hot-dip galvanized, with plain ends.
2. PVC Pipe Sleeves: ASTM D1785, Schedule 40.

B. Sleeves with Waterstop:

1. Description: Manufactured **stainless steel** or **galvanized steel**, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall.

C. Sleeve-Seal Systems:

1. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
   a. Hydrostatic Seal: 20 psig minimum.
   b. Sealing Elements: **High-temperature-silicone** interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size.
   c. Connecting Bolts and Nuts: **Carbon steel, with ASTM B633 coating** of length required to secure pressure plates to sealing elements.

D. Roof sleeves and sealant: The fire sprinkler contractor shall provide a sleeve and seal around roof pipe penetrations as required by the roof contractor and the roof product(s) manufacturer to maintain all roof warranties. The fire sprinkler contractor shall coordinate all installation requirements and installed products with the roofing contractor to ensure all products are compatible and acceptable to the roof product(s) manufacturer.

E. Grout:

1. Description: Nonshrink, for interior and exterior sealing openings in non-fire-rated walls or floors.
2. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
3. Design Mix: 5000 psi, 28-day compressive strength.
4. Packaging: Premixed and factory packaged.

F. Silicone Sealants:

1. Silicone Sealant, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant.
   a. Standard: ASTM C920, Type S, Grade NS, Class 25, Use NT.

2. Silicone Sealant, S, P, T, NT: Single-component, **100/50**, pourable, **plus 100 percent and minus 50 percent** movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant.
   a. Standard: ASTM C920, Type S, Grade P, **Class 100/50**, Uses T and NT.

2.2 ESCUTCHEONS

A. Escutcheon Types:

1. One-Piece, Cast-Brass Type: With finish and setscrew fastener.
2. Split-Plate, Stamped-Steel Type: With polished, chrome-plated finish; **concealed** hinge; and spring-clip fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION OF SLEEVES, GENERAL

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide **1-inch** annular clear space between piping and concrete slabs and walls.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

3.2 INSTALLATION OF SLEEVES WITH WATERSTOP

A. Install sleeve with waterstop as new walls and slabs are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange centered across width centered in concrete slab or wall.

C. Secure nailing flanges to wooden concrete forms.

D. Using grout or silicone sealant, seal space around outside of sleeves.

3.3 FIRE-RESISTANCE-RATED PENETRATIONS:

A. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of floors at pipe penetrations. Seal pipe penetrations with fire- or smoke-stop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.4 INSTALLATION OF SLEEVE-SEAL SYSTEMS

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building, and passing through exterior walls.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.5 INSTALLATION OF ESCUTCHEONS

A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

3.6 FIELD QUALITY CONTROL

A. Sleeves and Sleeve Seals:

1. Perform the following tests and inspections:
   a. Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.
   b. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.

2. Prepare test and inspection reports.

B. Escutcheons:

1. Using new materials, replace broken and damaged escutcheons and floor plates.

3.7 SLEEVES APPLICATION

A. Use sleeves and sleeve seals for the following piping-penetration applications:

1. Exterior Concrete Walls above and below Grade:
   a. Sleeves with waterstops.
      1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

2. Concrete Slabs-on-Grade:
   a. Sleeves with waterstops.
      1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

3. Roof: The fire sprinkler contractor shall coordinate all installation requirements and installed products with the roofing contractor to ensure all products are compatible and acceptable to the roof product(s) manufacturer. All fire sprinkler system penetration roof penetration seals shall be warrantied by the roof contractor, fire sprinkler contractor, and roof manufacturer.

3.8 ESCUTCHEONS APPLICATION

A. Escutcheons for New Piping and Relocated Existing Piping:

1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.
2. Chrome-Plated Piping: One piece or split plate steel with polished, chrome-plated finish.
3. Bare Piping in Unfinished Service Spaces:
   a. One piece, steel with polished, chrome-plated finish.
   b. One piece, stamped steel or split plate or steel with exposed-rivet hinge with polished, chrome-plated finish.

4. Bare Piping in Equipment Rooms.
   a. One piece, steel with polished, chrome-plated finish.

b. One piece, stamped steel or split plate or steel with exposed-rivet hinge with polished, chrome-plated finish.

END OF SECTION 210500

SECTION 210553 - IDENTIFICATION FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Pipe labels.
3. Stencils.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For color, letter style, and graphic representation required for each identification material and device.

C. Equipment-Label Schedule: Include a listing of all equipment to be labeled and the proposed content for each label.

D. Valve-numbering scheme.

E. Valve Schedules: Provide for fire-suppression piping system. Include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Brady Corporation.
   b. Carlton Industries, LP.
   c. Champion America.

2. Material and Thickness: stainless steel, 0.025 inch thick, with predrilled or stamped holes for attachment hardware.
3. Letter and Background Color: As indicated for specific application under Part 3.
4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
6. Fasteners: Stainless steel rivets or self-tapping screws.
7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Brady Corporation.
   b. Carlton Industries, LP.
   c. Champion America.

2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
3. Letter and Background Color: As indicated for specific application under Part 3.
4. Maximum Temperature: Able to withstand temperatures of up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.

2.2 PIPE LABELS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Actioncraft Products, Inc.; a division of Industrial Test Equipment Co., Inc.
2. Brady Corporation.
3. Carlton Industries, LP.

B. General Requirements for Manufactured Pipe Labels: Preprinted, color coded, with lettering indicating service and showing flow direction in accordance with ASME A13.1.

C. Letter and Background Color: As indicated for specific application under Part 3.

D. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

E. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

F. Pipe-Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings. Also include the following:

1. Pipe size.
2. Flow-Direction Arrows: Include flow-direction arrows on main distribution piping. Arrows may be either integral with label or applied separately.
3. Lettering Size: Size letters in accordance with ASME A13.1 for piping .

2.3 STENCILS

A. Stencils for Piping:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Craftmark Pipe Markers.
   b. Kolbi Pipe Marker Co.
   c. Marking Services Inc.

2. Lettering Size: Size letters in accordance with ASME A13.1 for piping .
3. Stencil Material: Aluminum, brass, or fiberboard.
4. Stencil Paint: Exterior, gloss, alkyd enamel . Paint may be in pressurized spray-can form.
5. Identification Paint: Exterior, alkyd enamel . Paint may be in pressurized spray-can form.
6. Letter and Background Color: As indicated for specific application under Part 3.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.

3.2 INSTALLATION GENERAL REQUIREMENTS

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be installed.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

D. Locate identifying devices so that they are readily visible from the point of normal approach.

3.3 INSTALLATION OF EQUIPMENT LABELS, WARNING SIGNS, AND LABELS

A. Permanently fasten labels on each item of fire-suppression equipment.

B. Sign and Label Colors:

1. White letters on an ANSI Z535.1 safety-red background .

C. Locate equipment labels where accessible and visible.

D. Arc-Flash Warning Signs: Provide arc-flash warning signs on electrical disconnects and other equipment where arc-flash hazard exists, as indicated on Drawings, and in accordance with requirements of OSHA and NFPA 70E.

3.4 INSTALLATION OF PIPE LABELS

A. Piping Color Coding: Painting of piping is specified in Section 099123 "Interior Painting."

B. Install pipe labels showing service and flow direction with permanent adhesive on pipes.

C. Stenciled Pipe-Label Option: Stenciled labels showing service and flow direction may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.

1. Identification Paint: Use for contrasting background.
2. Stencil Paint: Use for pipe marking.

D. Pipe-Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Within 3 ft. of each valve and control device.
2. At access doors, manholes, and similar access points that permit a view of concealed piping.
3. Within 3 ft. of equipment items and other points of origination and termination.
4. Spaced at maximum intervals of 25 ft. along each run. Reduce intervals to 10 ft. in areas of congested piping and equipment.

E. Flow- Direction Arrows: Provide arrows to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.

F. Fire-Suppression Pipe Label Color Schedule:

1. Fire-Suppression Pipe Labels: White letters on an ANSI Z535.1 safety-red background .

END OF SECTION 210553

SECTION 211100 - FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Section 21900 Water Based Fire Suppression Systems

1.2 PERFORMANCE REQUIREMENTS

A. Refer to “Performance Requirements” in Section 219000 “Water Based Fire Suppression Systems”.

1.3 DEFINITIONS

A. Refer to “Definitions” in Section 219000 “Water Based Fire Suppression Systems” for the definition of Fire Protection Engineer (FPE).

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified FPE responsible for their preparation.

C. Proof of plan approval by AHJ. Note: Contractor shall submit plans to AHJ for review per AHJ requirements.

D. Completed certificate “Contractor’s Material and Test Certificate for Underground Piping” contained in NFPA 24.

E. Record Drawings: Submit drawings showing sprinkler system as installed. Drawings shall be stamped with FPE seal indicating FPE has inspected and approved installation. Design details shown shall include, but are not limited to: piping materials, piping layout, valve locations, and installation details such as pipe bedding and depth of bury.

F. All above submittals shall be delivered prior to proposed scheduled final acceptance of sprinkler system. Refer to Section 219000.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
2. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, installation, and testing.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with the "Approval Guide," published by FM Global, or UL's "Fire Protection Equipment Directory" for fire-service-main products.

D. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, and flushing, for fire-suppression water-service piping.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport:

1. Ensure that all system components are dry and internally protected against rust and corrosion.
2. Protect system components against damage.

B. During Storage: Use precautions for storage according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Deliver piping with end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

D. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

E. Protect flanges, fittings, and specialties from moisture and dirt.

F. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Fire-Suppression Water-Service Piping: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:

1. Notify **Owner** no fewer than seven days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without **Owner's** written permission.

1.8 COORDINATION

A. Coordinate connection to water main with utility company.

PART 2 - PRODUCTS

2.1 DUCTILE-IRON PIPE AND FITTINGS

A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end.

B. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end.

C. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

1. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

D. Push-on-Joint, Ductile-Iron Fittings: AWWA C153, ductile-iron compact pattern.

1. Gaskets: AWWA C111, rubber.

E. Flanges: ASME B16.1, Class 125, cast iron.

2.2 PVC PIPE AND FITTINGS

A. PVC Pipe: DR18, Class 235 with bell end with gasket, and with spigot end.

B. Transition fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

2.3 ENCASEMENT FOR PIPING

A. Casing Pipe: Ductile iron pipe or reinforced concrete pipe.

B. Casing end seals: Flexible membrane suitable for applying to ends of casing to prevent soil from entering annular gap between pipe and casing.

1. Membrane: 1/8” thick. Either neoprene or coal tar reinforced with fiberglass.
2. Adhesive: Butyl mastic strips, suitable for bonding membrane to casing and pipe.
3. Clamps: Stainless steel band clamps.

C. Membrane Encasement

1. Standard: ASTM A 674 or AWWA C105.
2. Form: Sheet.
3. Color: Black.

2.4 VALVES

A. Curb Valves: Comply with AWWA C800 for high-pressure service-line valves. Valve has bronze body, ground-key plug or ball, wide tee head, and inlet and outlet matching service piping material.

B. Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches (75 mm) in diameter.

1. Shutoff Rods: Steel; with tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Comply with excavating, trenching, and backfilling requirements in Division 31 and NFPA 24.

3.2 PIPING INSTALLATION

A. For the following portions of the water service, install the water service per requirements of the owner of the local water utility in lieu of the requirements specified below.

B. Comply with NFPA 24 for fire-service-main piping materials and installation.

C. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.

1. Install encasement for piping according to ASTM A 674 or AWWA C105.

D. Bury piping with depth of cover over top at least 12 inches below level of maximum frost penetration, and according to the following:

1. In Loose Gravelly Soil and Rock: With at least 12 inches of additional cover.

E. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

F. Extend fire-suppression water-service piping and connect to water-supply source and building fire-suppression water-service piping systems at locations and pipe sizes indicated.

G. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

H. Install underground piping with thrust blocks at horizontal and vertical changes in direction. Use anchors, tie rods and clamps, and other supports.

I. Comply with requirements in Section 219000 “Water Based Fire Suppression Systems” for fire-suppression-water piping inside the building.

J. Install sleeves for piping penetrations of walls, ceilings, and floors.

K. Install sleeve seals for piping penetrations of concrete walls and slabs.

L. Where pipe passes under and close to footings (see drawings), install pipe in casing. Maintain 2” annular gap between pipe and casing. Install end seals.

3.3 JOINT CONSTRUCTION

A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure rating same as or higher than systems pressure rating for aboveground applications unless otherwise indicated.

B. Install unions adjacent to each valve in tubing NPS 2 and smaller.

C. Install flanges, flange adaptors, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

D. Ream ends of tubes and remove burrs.

E. Remove scale, slag, dirt, and debris from outside and inside of pipes, tubes, and fittings before assembly.

F. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.

G. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with bolts according to ASME B31.9.

H. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure.

I. Do not use flanges or unions for underground piping.

3.4 ANCHORAGE INSTALLATION

A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Concrete thrust blocks.
2. Locking mechanical joints.
3. Set-screw mechanical retainer glands.
4. Bolted flanged joints.
5. Heat-fused joints.
6. Pipe clamps and tie rods.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches in fire-suppression water-service piping according to NFPA 24 and the following:

1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

D.

3.5 CONNECTIONS

A. Connect fire-suppression water-service piping to existing water main per local water utility requirements.

B. Connect fire-suppression water-service piping to interior fire-suppression piping.

3.6 FIELD QUALITY CONTROL

A. Use test procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described below.

B. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

C. Hydrostatic Tests: Test at not less than one-and-one-half times the working pressure for two hours.

1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for one hour; decrease to 0 psig. Slowly increase again to test pressure and hold for one more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

D. Prepare test and inspection reports.

3.7 CLEANING

A. Clean and disinfect fire suppression water service piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
   a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
   b. Fill and isolate system according to either of the following:
      1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.

2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.

d. Repeat procedures if biological examination shows contamination.

e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Prepare reports of purging and disinfecting activities. Include copies of water-sample approvals from authorizes having jurisdiction.

3.8 PIPING SCHEDULE

A. Underground fire-suppression water-service piping shall be one of the following:

1. Mechanical-joint, ductile-iron pipe; mechanical-joint, ductile- or gray-iron, standard-pattern fittings; glands, gaskets, and bolts; and gasketed joints.
2. Push-on-joint, ductile-iron pipe; push-on-joint, ductile-iron compact-pattern fittings; and gasketed joints.

B. Aboveground fire-suppression water-service piping shall as indicated in Section 219000 “Water Based Fire Suppression Systems”.

C. Underslab fire-suppression water-service piping shall be as indicated in Section 219000 “Water Based Fire Suppression Systems”.

D. END OF SECTION 211100

END OF SECTION 211100

SECTION 219000 - WATER BASED FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Contract Drawings: The Fire Suppression System Drawings included with these specifications are utilized to illustrate the general locations of new system components and system boundaries of the fire suppression system. Through delegated design the fire sprinkler contractor provides detailed coordination of all system components for a compliant, acceptable, working, fire sprinkler system.

1.2 SUMMARY

A. Section Includes:

1. Steel pipe and fittings.
2. Cover system for sprinkler piping.
3. Specialty valves.
4. Sprinkler piping specialties.
5. Sprinklers.
6. Alarm devices.
7. Pressure gauges.

B. Related Requirements

1. Related Specification Section Requirements:
   a. 211100 – Facility Fire Suppression Water Service Piping
   b. 210500 – Common Work Results for Fire Suppression.
   c. 210553 – Identification for Fire Suppression Piping and Equipment

2. Code Requirements: The requirements in this specification section are based on the requirements of the 2022 California Building Code, 2022 California Fire Code, Local, State, and Federal regulations and amendments. Any additional details of the building code relating to the installation of the design identified in these specifications shall become a part of this contract. If the Contractor discovers conflicts between these specifications and the building code, they shall be brought to the attention of the Engineer prior to any deviations from Contract requirements.
3. Fire suppression system design, layout, materials, manufacture, installation, examination, testing, inspection, stamping certifications, and documentation shall conform to applicable portions of the latest issue of the following adopted codes, standards, and all addenda thereto.
   a. NFPA 13 – Installation of Sprinkler Systems
   b. NFPA 14 – Standard for the Installation of Standpipe and Hose Systems
   c. NFPA 24 – Standard for the Installation of Private Service Mains and Their Appurtenances

d. NFPA 25 – Inspection, Testing and Maintenance of Water Based Fire Protection Systems
e. NFPA 70 - National Electrical Code
f. NFPA 415 – Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways (Section 4.5 Fire Protection)
g. These specifications are based upon the standards and codes in force at the time of issue of these documents. Any conflict between referenced standards shall be referred to the Engineer who will determine which standard shall govern. All correspondence requiring a decision by the Authority shall be directed through the Engineer for resolution. The requirements of these specifications and associated drawings take precedence over the minimum requirements of the Codes and Standards listed above.

C. Scope: The Contractor shall layout, size, install and test all portions of the new fire sprinkler system installed throughout the San Luis Obispo Airport Terminal Building Membrane Structure and Membrane Structure Canopy. The fire sprinkler system work included under this section will begin within 5 feet of the exterior Membrane Structure wall. The major items of scope of work include, but are not limited to the following:

1. Provide and install fire sprinkler system components such as: water supply piping service entrance, system isolation valves, pipe, pipe supports, sprinklers, anti-freeze, anti-freeze expansion tank, pipe fittings, and all required other system components to ensure compliance with all regulations and to provide a fully acceptable, and functional fire sprinkler system.
2. Connect to the new underground fire service main within 5 feet of the building. Underground piping shall be installed in accordance with NFPA 24. The pipe joints must be restrained with concrete thrust blocks installed at pipe changes in direction. The fire sprinkler contractor, delegated design, must provide thrust block design in accordance with NFPA 24. Thrust block calculations must be submitted for review with the fire sprinkler shop drawings.
3. Layout, provide and install fire sprinkler and standpipe systems throughout the building as noted. Make detailed design adjustments to ensure the fire sprinkler and standpipe system is installed to prevent conflicts with other trade system components. Review all contract documents of other disciplines to ensure complete coordination of the fire sprinkler system.
4. Prior to starting detailed design, the fire sprinkler contractor shall perform a fire hydrant flow test in accordance with NFPA 291.
5. Details concerning the work required for the project are as follows in the specifications and as shown on the Contract Drawings.

D. Performance Requirements:

1. Delegated Design: Design fire sprinkler system(s), including comprehensive engineering analysis and drawing review by an FPE, using performance requirements and design criteria indicated in the contract documents and listed below. The fire sprinkler contractor FPE shall seal the fire sprinkler shop drawings. Fire sprinkler shop drawings may be prepared under FPE supervision by a Fire Sprinkler System Designer.
2. Fire Hydrant Flow Test Data:
   a. Available fire-hydrant flow test record:
      1) Performed By:
      2) Witnessed By:

3) Test Date/Time:
4) Static Pressure:
5) Residual Pressure:
6) Measured Flow:

b. Flow test indicated above is for information only and is not to be used in the design of the fire sprinkler system. The Contractor shall perform their own flow test prior to starting the system design.

3. Margin of Safety for Hydraulic Calculations shall be a minimum of 5 psi.
4. Fire Sprinkler Design Density and Occupancy Hazard Classifications: Design criteria shall be in accordance with the contract documents, code, referenced standard(s) requirements, and as listed below. Where a specific type of area or occupancy is not identified the contractor shall submit a request for information for clarification to the Engineer. Design areas shall be increased as required by NFPA 13. Where a more restrictive requirement is identified in a standard referenced by NFPA 13, the more restrictive requirement shall apply i.e., hose allowance requirements of NFPA 415 Section 4.5 Fire Protection.
   a. Baggage Handling:
      1) Minimum Density for Automatic-Sprinkler System Design and Hose Allowance:
         a) Ordinary Hazard Group 2: 0.20 gpm/sq. ft. over a minimum 1500 sq. ft. design area
         b) Provide for hose allowances in accordance with NFPA 13 and NFPA 415.
         c) Maximum Protection Area per Sprinkler
         d) Maximum protection area per sprinkler according to UL listing and NFPA 13 or 130 sq. ft. minimum for Ordinary Hazard.
5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application. All electrical circuits interfacing with the fire alarm system shall be installed in a metal conduit.
6. Sprinkler system equipment, specialties, accessories, installation, and testing to comply with NFPA 13 and NFPA 25.
7. Minimum System Equipment and Component Working Pressure Rating: 175-psig minimum.
8. Coordination Drawings: Sprinkler system plans and sections, or Building Information Model (BIM), drawn to scale, showing the items described in this Section and coordinated with all disciplines.

1.3 DEFINITIONS

A. Fire Protection Engineer (FPE): A registered professional Engineer (PE), who has passed the National Council of Examiners for Engineering and Surveys (NCEES) written examination in fire protection engineering.

B. Fire Sprinkler System Designer: A Level III Technician by National Institute for Certification in Engineering and Technologies (NICET) for Water-Based Systems Layout.

1.4 ACTION SUBMITTALS

A. Delegated-Design Submittals: The Contractor shall submit the documents electronically, for review, to the Engineer prior to the start of fabrication or installation. The Contractor shall upload the submittal to the Engineer's FTP site and send email notification of the upload to the Engineer. The submittal shall include required information for all work included in this section and referenced specifications including General Conditions and Division 01 Specifications. Documents shall be fully completed and certified by the Contractor as to the compliance of the information contained thereon with the requirements of the Contract Documents. Incomplete submittals will not be reviewed. Complete submittals will be reviewed by the Engineer and processed as specified in Division 1. The Engineer's review will be for general conformity to the specified requirements and is not intended to constitute detailed review or approval of content. Documents stamped NO EXCEPTION TAKEN do not relieve the Contractor from any contract requirements. In addition to the Division 01 Specification submittal requirements the following detailed requirements must be provided.

1. All drawings shall be prepared with computer drafting software. Drawings and data shall be in sufficient detail to indicate the kind, size, arrangement, and operation of component devices; the external connections, anchorages, and supports required; and dimensions needed for the installation and correlation with other equipment. All drawings shall be to a standard architectural scale which shall be noted on the drawings (including Graphic Representation). Drawing size shall not be less than 30 inches by 42 inches (B1) or greater than 34 inches by 44 inches (A0).
2. All Equipment and Material Data Sheets shall be submitted as a single PDF document. The document shall include bookmarks for each product submitted. Calculations shall be submitted as individual PDF files. Drawings shall be submitted as individual full-size PDF files. A separate transmittal PDF file shall be included. The drawings and calculations shall have a certification sheet bearing the NICET designer certification and the seal of the Contractor's registered professional engineer. All file names shall describe the file content. The transmittal shall also include the specification title, the specification number, and the Subcontractor's name.
3. Fire Sprinkler Shop Drawings: Piping drawings shall show all piping, devices, and information necessary for the complete installation. The drawings shall be plotted in a standard architectural scale. The drawings shall include the following items:
    a. Name of Owner and occupant
    b. Specification title and number.
    c. Contractor's name and address
    d. Location, including street address.
    e. Point of compass.
    f. Full height cross section, or schematic diagram, including ceiling construction.
    g. Location of partitions.
    h. Location of fire rated barriers or walls and smoke barriers.
    i. Locations of lights, diffusers, equipment, large piping, etc. located near the sprinklers or in other locations that could be obstructions to the sprinkler discharge.
    j. Location of unit heaters and direction of airflow.
    k. Any concealed spaces in which no sprinklers are to be installed.
    l. Size of city main in the street and whether dead end or circulating; and, if dead end, direction and distance to nearest circulating main.
    m. Water supply test results and system elevation relative to test hydrant
    n. Make, type, temperature rating, and nominal orifice size of sprinklers

o. Total area protected by each system, on each floor.
p. Number of sprinklers on each system.
q. Pipe type and schedule of wall thickness.
r. Nominal pipe size and cutting lengths of pipe (or center to center dimensions). Where typical branch lines prevail, it will be necessary to size only one typical line.
s. Location, size and length of riser nipples.
t. Type of fittings and joints and location of all welds and bends. The contractor shall identify on drawing any section to be welded and the type of fittings or formation to be used.
u. Type and location of hangers, sleeves, and braces.
v. All control valves and check valves
w. All main drains, low point drains and inspector's test connections. All piping associated with drains shall be shown.
x. Underground pipe size, length, location, weight, material, point of connection to the City main; the type of valves, meters, and valve pits; and the depth that top of the pipe is laid below grade.
y. The information that will be on the hydraulic design information sign.
z. Hydraulic reference points.
aa. Clear outline of the hydraulically most remote area used in calculations.
bb. The minimum rate of water application (density), the design area of water application.
cc. Relative elevations of sprinklers, nozzles, junction points, and supply or reference points.
dd. Information about backflow preventers (manufacturer, size, type) and nameplate data.

4. Equipment and Material Data Sheets: Equipment data sheets shall be submitted for all equipment and devices used in the systems. If options are listed on the data sheets, the specific option for the project shall be clearly marked. The data sheet submittal shall include, but not be limited to the following:
   a. Sprinkler System Valves - Documents shall include data sheets and instruction manuals
   b. Isolation Valves
   c. Sprinklers
   d. Pipe - If more than one pipe type is used, the sheets shall be marked to indicate the application of each type.
   e. Pipe Supports and Hanger Assemblies - Hanger assembly drawings (hanger, rod, structure attachment, etc.) are required for each assembly type used on the project.
   f. Waterflow switches and valve tamper switches
   g. All signs and materials as required by NFPA 13.
   h. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

5. Fire Sprinkler System Hydraulic Calculations: Hydraulic calculations shall be submitted for each sprinkler system zone in accordance with NFPA 13. Calculations shall include all piping back to the tested water supply. The contractor shall submit a dimensioned sketch showing pipe sizes, lengths, fittings, and hydraulic node points for any piping in calculations that are not shown on the Contractor's shop drawings. This sketch shall be attached to the calculations or included on the shop drawings. The hydraulic calculations

shall be signed and sealed by the FPE. All existing fire sprinkler systems with cross main and feed main modifications shall be recalculated.

6. Fire hydrant flow test report: The fire hydrant flow test data from the tests shall be submitted with the hydraulic calculations.
7. Fire sprinkler shop drawings and calculations shall be signed and sealed by the Contractor FPE.

B. Submittal Disposition

1. The reviewed documents will be returned, in one of the following ways.
   a. No Exception Taken
   b. Implement Exceptions Noted
   c. Revise and Resubmit
   d. Rejected, Resubmit
   e. When the documents are returned marked NO EXCEPTIONS TAKEN, the Contractor is released to being fabrication and installation.
   f. When the documents are returned marked IMPLEMENT EXCEPTIONS NOTED, the Contractor shall make the noted changes and is released to begin fabrication and installation. The changes do not need to be resubmitted until the Record Document markups are submitted. Record Document markups shall have the revisions clouded.
   g. When the documents are returned marked REVISE AND RESUBMIT, the basic design is accepted, however, the Contractor is not released to fabricate or begin installation. A complete resubmittal is required (all documents) unless specifically noted otherwise. All revisions shall be clouded. The NICET Certification or Engineer's seal or third-party review letter is required on resubmittal.
   h. When the documents are returned REJECTED, RESUBMIT, the Contractor shall redesign based on the comments and resubmit. All revisions shall be clouded. The NICET Certification or Engineer's seal or third-party review letter is required on the resubmittal.
   i. Resubmittals will not be reviewed without a correction or response for each review comment (clouded).

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Qualifications: Submit the name and documentation of certification of the qualified individuals no later than 14 days after the Notice to Proceed and prior to the submittal of the sprinkler system drawings and hydraulic calculations.

1. Fire Protection Engineer: Qualifications of the Fire Protection Engineer, with license number, shall be submitted to and approved by architect/engineer prior to submission of the shop drawings. For the purposes of these specifications, the FPE shall have the following qualifications:
   a. The FPE shall be a registered Professional Engineer (PE), who has passed the National Council of Examiners for Engineering and Surveys (NCEES) written examination in fire protection engineering.

2. Fire Sprinkler System Designer: The fire sprinkler system design must be certified as a minimum Level III Technician by National Institute for Certification in Engineering and Technologies (NICET) for Water-Based Systems Layout.

3. Welding and Welder Qualifications: Submit procedures and operator's qualifications according to ASME Boiler and Pressure Vessel Code.

1.6 CLOSEOUT SUBMITTALS

A. Operations and Maintenance Manual: The Operation, and Maintenance Manual shall be submitted for final review with the red line record drawings within three (3) weeks of the final acceptance test completion.

B. Record Drawings, Calculations, and Acceptance Test Certificates:

1. Marked-up Shop Drawings (red-lines) and Record Drawings shall be submitted to the Engineer and Owner. Red-lines shall be submitted prior to the acceptance test. Each phase's Record Drawings are required to be submitted prior to the request for the test for the next phase. Record drawings are required to be submitted to the Engineer within two (2) weeks after the acceptance test.
2. Calculations: Calculations shall be revised as required based on the updated red-lines for any design change. Record calculations shall be submitted to the Engineer within two (2) weeks after the acceptance test.
3. Acceptance Test Certificates: All acceptance test certificates must be submitted with the Record Drawings.
4. In addition to the Division 01 Specifications the following must be provided. After acceptance of all documents, one hard copy set of drawings shall be rolled, placed in a PVC pipe and mounted securely adjacent to the fire sprinkler riser(s). A CD or DVD shall accompany the hard copy. Drawings shall be included as individual full-size PDF files and individual bound CAD files. A copy of the CD or DVD shall be forwarded to the Engineer.

1.7 PROJECT CONDITIONS

A. Existing System Equipment: The existing building is protected throughout by an existing fire sprinkler system. Demolish and modify the existing fire sprinkler system as indicated on the contract document drawings.

B. Interruption of Existing Fire Sprinkler System: Do not interrupt the existing fire sprinkler service to facilities occupied by the Owner or others unless permitted under the following conditions, and then only after arranging to provide a temporary fire watch according to the requirements indicated:

1. Notify the Owner no fewer than 14 calendar, or 10 business days, in advance of proposed date of interruption to the sprinkler service.
2. Do not proceed with interruption of the fire sprinkler service without the Owner's written permission.

1.8 SEQUENCING AND SCHEDULING

A. System design and installation shall be sequenced with the construction schedule.

B. Existing Fire Sprinkler System: The existing fire sprinkler system shall remain operational as required to prevent and reduce system impairments during the project.

C. Equipment Removal: The existing fire sprinkler system components that will be demolished or deconstructed shall be sequenced with the construction schedule to prevent and reduce system impairments during the project.

D. Delivery Storage and Handling: All piping and materials shall be delivered to the project and stored in a secured location protected from the elements. All material shall be stored to prevent ground contact and damage due to environmental weather conditions. All material shall be handled to prevent damage to system components.

1.9 WARRANTY

A. Provide warranty in accordance with Division 01.

PART 2 - PRODUCTS

2.1 IN-BUILDING RISER

A. Fittings: Provide an in-building riser to connect the underground piping to the aboveground fire sprinkler piping. Provide the component in accordance with the manufacturer's installation requirements, NFPA 13, and NFPA 24. The system component must be UL Listed, FM Approved, and meet the listed criteria below.

1. Material: Stainless steel
2. Manufacturer(s) / Product: Watts, AMES / In-building Riser

2.2 STEEL PIPE, PIPE FITTINGS, AND STEEL PIPE SCHEDULE

A. Fittings: Provide fire sprinkler piping and fittings meeting the requirements of NFPA 13, NFPA 24, UL Listed, FM Approved, and the listed criteria below.

1. Steel Pipe Nipples: UL Listed or FM Approved for Fire Protection. ASTM A733, made of ASTM A53/A53M
2. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
3. Welded Fittings: UL Listed or FM Approved for Fire Protection. ASTM A234/A234M and ASME B16.9.
4. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
5. Grooved-End Fittings: UL Listed or FM Approved for Fire Protection. ASTM A536
6. Grooved Couplings: UL Listed or FM Approved for Fire Protection. ASME B31.3, ASTM A-536, Grade 65-45-12, ASTM A-395, Grade 65-45-15
7. Gray-Iron Threaded Fittings: UL Listed or FM Approved for Fire Protection. ASME B16.4
8. Malleable- or Ductile-Iron Unions: UL Listed or FM Approved for Fire Protection.

9. Cast-Iron and Steel Flanges and Flanged Fittings: UL Listed or FM Approved for Fire Protection. ASME B16.5
10. Class 125 and Class 250, Cast-Iron, Flat-Face Flanges: Full-face gaskets.
11. Class 150 and Class 300, Ductile-Iron or -Steel, Raised-Face Flanges: Ring-type gaskets.
12. Flange Gasket Materials: EPDM rubber gasket.
13. Flange Bolts and Nuts: Electrogalvanized steel unless otherwise indicated.

B. Steel Pipe and Schedule: Provide fire sprinkler piping meeting the pipe schedule, the requirements of NFPA 13, NFPA 24, and the listed criteria below.

1. Schedule 10, Steel Pipe: ASTM A135/A135M or ASTM A795/A795M. Schedule 10 piping shall be FM Approved for its intended use.
2. Schedule 40, Steel Pipe: ASTM A53/A53M, Grade B

C. Pipe Coating:

1. Type of Coating: Two-part Epoxy
2. Surface Preparation: Society of Protective Coatings Standard, SSPC-SP 6 surface preparation criteria
3. Reference Specification: 099656 Epoxy coatings
4. Coating color: Safety Red
5. Coating system: Master Painter Institute (MPI), System #120
6. Manufacturer/Product(s): PPG/Amerlock 600, Sherwin Williams/Macropoxy 646, or Engineer approved equivalent.

2.3 HANGERS AND HANGER FASTENERS

A. Hangers, Pipe Supports, and Hanger Fasteners: Provide in accordance with the membrane structure manufacturer's requirements, NFPA 13, and NFPA 14.

B. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be the weight of the water filled pipe plus 250 lbs.

1. Adjustable, Swivel-Ring Band Hangers
   a. UL Listed or FM Approved for Fire Protection Service
   b. Hanger Rod and Fasteners: Threaded with minimum 3/8" diameter.
   c. Structural Attachments: Beam clamp or as required to provide a compliant connection to the structure.
   d. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finishes.

2. Steel Pipe Clamps and Riser Clamps
   a. UL Listed or FM Approved for Fire Protection Service

3. Trapeze Hanger
   a. UL Listed or FM Approved for Fire Protection Service
   b. Pipe supports with steel-pipe base stanchion support and cast-iron floor flange.
   c. UL Listed or FM Approved for Fire Protection Service

4. Membrane Manufacturer Hanger Supports:
   a. Provide testing documentation that the design of the hanger supports the weight of the water-filled pipe plus 250 lbs. Design the hanger support system so that point loads at each hanger do not exceed 300 lbs.
      1) Where the point load exceeds 300 lbs provide trapeze hanger supports in accordance with NFPA 13 spanning and supported by two structural members.
      2) Coordinate with the membrane manufacturer hanger details for all connection points to the membrane structure. Provide hanger details on shop drawings.

2.4 VALVES

A. Check Valves: Provide in accordance with the manufacturer's requirements and NFPA 13 for each fire sprinkler riser. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements of NFPA 25. Provide in accordance with the manufacturer requirements and NFPA 13 for each fire sprinkler riser. Provide components meeting the listed criteria below.

1. UL Listed or FM Approved for Fire Protection Service
2. Size: In accordance with NFPA 13 and NFPA 25.

B. Butterfly Valves with Indicator and Integral Tamper Switch: Provide in accordance with the manufacturer's requirements and NFPA 13 for each fire sprinkler riser. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements of NFPA 25. Provide components meeting the listed criteria below.

1. UL Listed or FM Approved for Fire Protection Service
2. Size: In accordance with NFPA 13 and NFPA 25.

C. Rising-stem OS&Y Gate Valves: Provide in accordance with the manufacturer's requirements and NFPA 13. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements of NFPA 25. Provide components meeting the listed criteria below.

1. Provide to meet system testing requirements in accordance with NFPA 25 and the listed criteria below.
2. UL Listed or FM Approved for Fire Protection Service
3. Size: In accordance with NFPA 13 and NFPA 25.

D. Trim and Drain Valves: Provide in accordance with the manufacturer's requirements and NFPA 13. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements as required by NFPA 25. Provide components meeting the listed criteria below.

1. Ball Valves and Globe Valves shall be UL Listed.

2.5 SPECIALTY VALVES

A. Automatic Ball Drip Valve: Provide in accordance with the manufacturer's requirements, NFPA 13 for each Fire Department Connection and the listed criteria below. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements of NFPA 25.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Size: In accordance with NFPA 13.

B. Inspector's Test and Drain Valve Assembly: Provide in accordance with the manufacturer's requirements and NFPA 13 for each fire sprinkler riser. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements of NFPA 25. Provide components meeting the listed criteria below.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Size: In accordance with NFPA 13 and NFPA 25.

C. Air Vent Valve: Provide in accordance with the manufacturer's requirements, NFPA 13 for each fire sprinkler system zone. Install components in accessible locations to meet the system testing, inspection, and maintenance requirements of NFPA 25. Provide components meeting the listed criteria below.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Size: In accordance with NFPA 13

D. Angle Hose Valve: Provide in accordance with the manufacturer's requirements, NFPA 13, NFPA 14, and the listed criteria below.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Size: 2-1/2"
3. Thread Type: National Standard Threads

2.6 HOSE VALVE CABINET

A. Hose Valve Cabinet (Standpipe Hose Valves): Provide in accordance with the manufacturer's requirements, NFPA 14, and the listed criteria below.

1. Standard: UL Listed where installed in a fire-resistance-rated construction.
2. Mounting: Recessed or Surface Mounted
3. Color: White
4. Door Type: Flush solid metal door with lock
5. Labeling: Provide label with red text stating FIRE DEPARTMENT VALVE
6. Manufacturer(s) / Product: Potter Roemer / Series 1810 or equivalent

2.7 BACKFLOW PREVENTION ASSEMBLY

A. Backflow Prevention Assembly: Provide in accordance with the manufacturer's requirements, NFPA 13, NFPA 14, and the listed criteria below.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Type: Reduced Pressure Zone
3. UL Listed or FM Approved Installed Orientation: Horizontal
4. Required Installed Orientation: Horizontal

2.8 FIRE DEPARTMENT CONNECTION (AUTO. SPKR.)

A. Hose Valve Cabinet (Standpipe Hose Valves): Provide in accordance with the manufacturer's requirements, NFPA 13, and the listed criteria below.

1. Standard: UL Listed (UL 405) or FM Approved for Fire Protection Service
2. Type: Siamese Wye
3. Material: Corrosion-resistant metal
4. Connection Size: 2-1/2"
5. Cap: Threaded Cap
6. Escutcheon Plate: Round, brass, wall type
7. Escutcheon Plate Marking: AUTO. SPKR.

2.9 ALARM DEVICES

A. Water-Flow Switch: Provide the fire alarm system interfaced equipment in accordance with the manufacturer's requirements, NFPA 13, NFPA 70, NFPA 72, and the listed criteria below.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Actuation Method: Paddle Movement During Water Flow
3. Delay Range: 0 – 90 seconds
4. Delay Set: 30 seconds

B. Rising Stem OS&Y Valve Tamper Switch: Provide the fire alarm interfaced equipment in accordance with the manufacturer's requirements, NFPA 13, NFPA 70, NFPA 72, and the listed criteria below.

1. Standard: UL Listed or FM Approved for Fire Protection Service
2. Actuation Method: Manual Valve Handle Movement

2.10 ANTI-FREEZE

A. Anti-freeze: Provide pre-mixed anti-freeze solution in accordance with the manufacturer's requirements, NFPA 13 and the listed criteria below.

1. Standard: UL Listed (UL 2901) for Fire Protection Service

2.11 ANTI-FREEZE EXPANSION TANK

A. Anti-freeze Expansion Tank: Provide pre-mixed anti-freeze solution in accordance with the manufacturer's requirements, NFPA 13 and the listed criteria below.

1. Standard: UL Listed (UL 2581A) for Fire Protection Service
2. Size: Determined by delegated design FPE.
3. Temperature Range: Determined by delegated design FPE.
4. Location: Floor mounted

2.12 PRESSURE GAUGES

A. Pressure Gauges: Provide in accordance with the manufacturer's requirements, NFPA 13 and the listed criteria below.

1. Pressure gauges shall meet UL 393 Standard for Safety Indicating Pressure Gauges for Fire-Protection Service or FM Approval Standard 311 for Vacuum and pressure Gauges for Fire Protection. Pressure gauges shall meet the requirements listed.
2. Dial Size: 4-1/2-inch diameter
3. Pressure Range: 0 to 300 psig.
4. Label: Include "WATER" label on dial face.
5. Be factory calibrated with calibration certificate.

2.13 SPRINKLERS AND SPRINKLER SCHEDULE

A. Fire Sprinklers: Provide fire sprinklers in accordance with the manufacturer requirements, NFPA 13, and the listed criteria below.

1. All fire sprinklers shall be listed to UL 199 Standard for Automatic Sprinklers for Fire-Protection Service and FM Approval Standard 2000 Approval Standard for Automatic Sprinklers for Fire Protection Service.
2. Fire Sprinkler Pressure Rating: 175 psig minimum
3. Fire Sprinkler K-factor: Minimum K-5.6 unless indicated otherwise.
4. Fire Sprinkler Temperature Rating: Sprinkler temperature ratings shall be ordinary temperature type for conditioned areas. Fire sprinkler temperatures other than ordinary temperature shall be located near heat producing sources in accordance with the requirements outlined in NFPA 13.Provide high temperature sprinklers where exposed to exterior ambient conditions installed underneath exposed steel or in direct sunlight
5. Fire Sprinkler Response Type: Quick response in all areas unless otherwise required by NFPA 13 or indicated otherwise.
6. Fire Sprinkler Coverage Type: Standard coverage unless indicated otherwise.
7. Only sprinklers with their original factory finish are acceptable. Remove and replace any sprinklers that are painted or have any other finish than their original factory finish. Use sprinkler types and finishes below for the following applications.
8. Sprinklers installed recessed in ceilings throughout the building must be chrome finished with chrome escutcheon plates.
9. Sprinklers installed above ceilings or in areas where there are no ceilings must be brass finish.
10. Fire sprinklers installed in mechanical, electrical, telecommunication, and areas with sensitive electronics shall be provided with a manufacturer's protective guard.

2.14 SPARE EQUIPMENT

A. Spare Equipment: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

PART 3 - EXECUTION

3.1 GENERAL

A. This section covers the installation and the installation material requirements for the sprinkler and standpipe system. All products must be installed in accordance with adopted codes, standards, and manufacturer requirements.

B. Products and Materials: Unless specifically provided otherwise in each case, all products and materials furnished for permanent installation in the work shall conform to the applicable standard specifications and shall be new, unused, and undamaged.

C. All products and materials furnished for the incorporation into the work shall be asbestos free.

D. Personnel: The Installation Supervisor shall be on the job site during the entire installation. The Supervisor shall have all contract documents on site at all times. The Supervisor shall also have a copy of all submittals (shop drawings and all other documentation). The Supervisor shall be responsible for daily updating of the shop drawings and other data to reflect the actual installation (red-lines). These drawings shall be made available to the Engineer for review at any time.

E. Workmanship: Details of erection work not covered herein shall conform to the accepted good engineering practice, the Contract Drawings, applicable nationally recognized codes and standards, and all applicable federal, state, and local codes and amendments.

1. All defects in erection shall be corrected to the satisfaction of the Owner. The dismantling and reassembly or equipment to remove defective parts, replace parts, or make adjustments shall be included as part of the work under these specifications.
2. All work areas shall be cleaned daily prior to the end of the work shift of construction debris. All work areas and associated equipment and materials shall be organized to prevent trip hazards and maintain a clear means of egress from the building and work area exits.

F. Construction Phasing: Construction phasing shall be coordinated with the General contractor and be acceptable to the Engineer. Reference Contract Documents sheet set for additional information on construction phasing.

G. Perform fire-hydrant flow test in accordance with NFPA 13 and NFPA 291. Use results for system hydraulic calculations.

1. Provide a test report within 7 days of performing the fire hydrant flow test. Test report shall include a hydrant map showing the location of the residual hydrant, flow hydrant, underground main routing, size, facility outline, and north arrow.
2. The hydrant flow test report shall provide the pressure results of the residual hydrant and pitot gage.
3. The hydrant flow shall be calculated in accordance with NFPA 13 and NFPA 291.
4. The number of hydrant outlets, diameter, and discharge coefficient shall be identified. The estimated available flow at 20 psi shall be in the report.
5. A water supply graph shall be included in accordance with NFPA 291 utilizing a logarithmic graph.
6. If during the test it's determined that the water supply is of poor flow quality, potentially not meeting the fire sprinkler system demand, the test shall be performed to determine the actual available flow as close to 20 psi residual pressure as feasible.
7. The report shall be sealed by the registered design professional.

3.2 EQUIPMENT LOCATIONS AND DETAILS OF INSTALLATION

3.3 FIRE PROTECTION WATER SERVICE ENTRANCE PIPING

A. The Contractor shall confirm that the new fire sprinkler fire service main has been tested and flushed in accordance with NFPA 24 prior to connecting any components of the sprinkler system. Reference Specification Section 211100 Facility Fire-Suppression Water-Service Piping.

3.4 WATER SUPPLY CONNECTIONS

A. Connect fire suppression system piping to the fire suppression water service piping only after all certified acceptance test documents have been provided to the Engineer and Owner for record.

B. Install all system components in accordance with NFPA 24 for underground piping and NFPA 13 for aboveground piping.

3.5 ABOVEGROUND PIPE JOINT CONSTRUCTION

A. Joint Construction: Joint construction shall be executed in accordance with the manufacturer's recommendations, NFPA standards, and as listed below.

1. Ream ends of pipes to remove burrs after cutting pipe.
2. Remove scale, slag, dirt, and debris from inside and outside of pipes and fittings before assembly.
3. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
4. Roll-Grooved Joints: Roll groove in end of pipe in accordance with manufacturer's criteria utilizing grooving equipment that meets manufacturer grooved fitting dimensions and tolerances.

5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
6. Do not use pipe or pipe fittings with threads that are corroded or damaged.
7. Apply appropriate tape and thread compound to external pipe threads.
8. Assembly pipe to required torque to prevent all pipe leaks.
9. As prescribed by NFPA 13, all threaded fittings and pipe shall conform to ANSI Standard B1.20.1, Pipe Threads, General Purpose (Inch). The Contractor shall have a full set of taper threaded ring and plug gauges referenced by ANSI B1.20.1 and shall check every fifteenth thread cut in the fabrication shop. Threads found out of tolerance shall be rejected, and the tool dies shall be adjusted or replaced until within tolerances. Field threading shall be performed only if absolutely necessary. Standard threaded fittings purchased from an approved manufacturer and not cut by the Contractor or fabricator need not be checked by the Contractor.

B. Welded Joints: All shop and field welding shall be in accordance with the ASME Code for Pressure Piping, ANSI/ASME B31.1, Power Piping, and the following requirements. Field welding shall be performed only with specific approval from the Engineer.

1. Qualification and Procedures: All welding procedures, welders, and welding operators shall be qualified in accordance with SECTION IX of the ASME Boiler and Pressure Vessel Code before work is begun by the individual welders and welding operators. All welding procedures shall be submitted to the Engineer for review prior to beginning the work. The welding procedures shall be written in conformance with the code edition and addenda stated for the applicable code.
2. The submittals shall clearly state the piping materials and wall thicknesses on which each procedure submitted will be used. The welding procedures shall include the joint design details and welding current and voltage values to be used. Records of the names of the welders who make each weld shall be maintained. Certified copies of any or all the above records shall be furnished to the Engineer upon request.
3. All welding shall be performed using an electric arc welding process which has been qualified in accordance with the rules of the code and has the concurrence of the Engineer.

3.6 ABOVEGROUND PIPE COATIN

A. All fire sprinkler system piping shall be epoxy coated. Fire sprinkler piping shall be prepared for epoxy coating in accordance with specification 099656 Epoxy coatings and meet SSPC-SP 6 surface preparation criteria and meet MPI (Master Painter Institute) #120 detailed performance criteria.

1. All prefabricated piping abrasive blasted prior to epoxy coating shall have all grooved and threaded end finishes and outlets capped and plugged prior to the abrasive blasting process to prevent damage.
2. The contractor shall ensure that the coating film thickness does not exceed the tolerances required by the fitting manufacturer for the installation of grooved fittings and threaded fittings from being met, impacting the performance of pipe joints.
3. Finished piping shall be protected during all stages of shipping, handling, delivery, and installation to prevent damage to the coating as much as feasible.

4. Field touchup of the coating shall be accounted for and provided by the contractor on all pipe with minimally damaged coatings.
5. Field touchup of the coating shall be within the specified timeframe of the manufacturer's product requirements. Product shall be selected by the contractor in accordance with the project schedule and phasing to ensure that touchup timeframe falls within the construction schedule and installation of pipe. The contractor shall be responsible for refabricating the piping, surface preparation, and applied coating for pieces of pipe after installation requiring touchup that is outside the product manufacturer's specified timeframe.
6. The field applied epoxy coating for touchups shall be the same as applied during the initial application process.
7. Coatings that exceed minimal damage as determined by the Engineer shall be refabricated and recoated. Replacement of damaged piping shall be at the expense of the contractor.
8. All piping shall be flushed with compressed air to ensure that all abrasive blasting material has been removed from the pipe prior to installation.
9. All threaded connections shall have pipe dope and Teflon tape applied.

3.7 INSTALLATION OF ABOVEGROUND PIPING

A. Locations and Arrangements: Install piping as indicated on accepted delegated-design shop drawings. Piping installation shall comply with NFPA 13 in addition to the following:

1. Sprinkler piping downstream of the isolation valves on wet pipe systems, with a pipe diameter of 2½ inches (65 mm) and larger shall be black steel, Schedule 10 minimum. Piping with a pipe diameter less than 2½ inches (65 mm) shall be Schedule 40 minimum.
2. Drain risers shall be black steel, Schedule 40 minimum. Drain risers shall be a minimum 2" diameter unless indicated otherwise.
3. Piping for Fire Department Connections shall be Schedule 10 black steel with roll-grooved ends, grooved-end fittings, grooved-end pipe couplings, and roll-grooved joints.
4. Threading of piping with a wall thickness less than that of Schedule 40 is prohibited.
5. Piping shall not be installed above, or within a horizontal distance of three feet from, electrical equipment such as switchgear, switchboards, control panels, motor controls, contactors, communication equipment, unless written consent of the Engineer is obtained. Piping shall not be installed above electrical equipment and shall be routed outside of dedicated equipment space and working space requirements as defined in NFPA 70. Improperly located piping shall be removed and relocated at the Contractor's expense. Piping in areas with finished ceilings, shall be routed above the ceilings and shall not interfere with ceiling tile. Piping shall be routed as close as feasible to the top of the structure to permit clearance between the fire suppression piping that is installed prior to other disciplines system equipment.
6. Coordinate layout and installation of fire sprinkler system equipment with all other disciplines system equipment. Including electrical, mechanical, plumbing, structural, architectural, information technology, and other as applicable.
7. Install sprinkler piping with drains and valving to allow for complete system drainage in accordance with NFPA 13. Install a drain cap on the fire sprinkler manifold with a 1" ball threaded ball valve. Install a threaded plug in the ball valve and tighten the plug with a wrench as needed to prevent overtightening the plug and removal of the plug by hand.

8. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 210500 – Common Work Results for Fire Suppression.
9. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 210500 – Common Work Results for Fire Suppression.

3.8 INSTALLATION OF HANGERS

A. Locations and Arrangements: Install piping hangers as indicated on accepted delegated-design shop drawings. Piping installation shall comply with NFPA 13 in addition to the following:

1. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.
2. Install membrane structure hangers in accordance with the membrane manufacturer's requirements.

3.9 INSTALLATION OF VALVES AND SPECIALTIES

A. Installation of Valves: Install valves as indicated on accepted delegated design shop drawings. Piping installation shall comply with NFPA 13 in addition to the following:

1. Install listed fire sprinkler isolation valves, trim and drain valves, specialty valves and trim, controls, and specialties in accordance with NFPA 13.
2. Install listed fire sprinkler isolation valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
3. Install Test and Drain valve for each sprinkler riser complete with shutoff valve, site glass, and pressure relief valve. Test orifice sized in accordance with NFPA 13.
4. Install tamper switches on system isolation valves as indicated.
5. Install an automatic ball drip valve between each check valve and fire department connection. Install drainpipe on ball drip valve and route discharge pipe to building drain or the exterior of the building. Discharge pipe shall discharge water on a splash block or paved surface.
6. Install pressure gauges on each fire sprinkler riser. Include pressure gauges with connection not less than NPS 1/4 and with metal seated globe valve. Install globe valve to permit gauge removal.

B. Installation of Specialty Valves: Install specialty valves as indicated on accepted delegated-design shop drawings. Piping installation shall comply with NFPA 13 in addition to the following.

1. Install valves in their listed position(s) for proper direction of flow in main supply to system.
2. Air Vent: Provide at least one air vent assembly at high point in each wet-pipe sprinkler system in accordance with NFPA 13 requirements.
3. Pipe outlet of air vent assembly to drain or exterior of the building.
4. Auxiliary Drain Valve: Install auxiliary drain valves to permit draining the system and testing of anti-freeze solution.

3.10 INSTALLATION OF SPRINKLERS

A. Installation of sprinklers: Install sprinklers in accordance with the manufacturer's recommended installation procedures and NFPA 13.

3.11 INSTALLATION OF FIRE DEPARTMENT CONNECTION

A. Installation of fire department connection: Install fire department connection in accordance with the manufacturer's recommended installation procedures and NFPA 13.

1. Ball Drip Valve: Install ball drip valve and route drainpipe to exterior.
2. Install fire department connection identification escutcheon plate prior to installing the fire department connection.
3. Sleeve and Sealing of Exterior Wall Penetration. Provide sleave around seal around exterior fire department connection wall penetration in accordance with 210500 – Common Work Results for Fire Suppression.
4. Seal the membrane structure wall penetrations with membrane sealing kits compatible with or manufactured by the membrane structure manufacturer.

3.12 INSTALLATION OF BACKFLOW PREVENTION ASSEMBLY

A. Installation of backflow prevention assembly: Install backflow prevention assembly in accordance with the manufacturer's recommended installation procedures and NFPA 13.

1. Sleeve and Sealing of Exterior Wall Penetration. Provide a sleave and seal around the exterior backflow prevention test header wall membrane structure wall penetration in accordance with 210500 – Common Work Results for Fire Suppression.

3.13 IDENTIFICATION

A. Install all required valve tags, hydraulic placards, equipment identification placards, and system zone signage in accordance with the contract documents and requirements of NFPA 13.

B. Install fire department connection escutcheon plate indicating fire sprinkler system.

C. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 - Identification for Electrical Systems.

3.14 SYSTEM TESTS

A. General: This sub-section covers testing of the fire protection system furnished, modified, and installed under these specifications. All defects discovered by testing shall be corrected and the systems retested. Refer to Section 210800 – Commissioning of Fire Suppression for additional requirements.

B. Pre-Tests: The Contractor shall notify the Engineer in writing of the proposed pre-test date at least two weeks in advance. Test date and time are subject to the approval of the Engineer so

that the Engineer may attend in person or otherwise decline to attend in person. If the Engineer declines to attend in person, the test date may be determined otherwise. The Contractor shall completely pre-test the system after installation is complete and prior to the final acceptance test. The Contractor shall provide the Owner and the Engineer with a "Contractor's Material and Test Certificate" (above ground and underground) for the fire protection systems installed herein, in accordance with NFPA 13 at least 48 hours before the final acceptance test.

C. Final Tests: The Contractor shall notify the Engineer in writing of the proposed test date at least two (2) weeks in advance. Test date and time are subject to the approval of the Authority Having Jurisdiction. The Engineer will witness all final acceptance testing.

D. Test Requirements: The following are the minimum tests to be performed for each type of system. All labor and equipment for testing shall be provided by the Contractor. Calibrated gauges shall be used for all testing. Pre-testing shall include all items listed below. Final testing will include all items except hydrostatic and pneumatic testing.

1. Fire Service Main: The fire service main shall be flushed and tested in accordance with the procedures and requirements of NFPA 13, and NFPA 24. The following tests shall be performed:
2. Flushing of Piping from the backflow preventer to the building floor outlet shall be flushed at the flow rates and using the methods outlined in NFPA 24. Discharge of flushing shall be through each point of system connection at the building floor line.
3. Hydrostatic Test: The hydrostatic test shall be per the requirements of NFPA 24. This test will be observed by the Owner or Owners Representative. A properly completed Contractors Materials and Test Certificate for Underground Piping shall be submitted at the conclusion of the test. The system shall be hydrostatically tested at not less than 200 psi (13.8 bar). The maximum acceptable leakage rate shall be two quarts (1.9 L) per hour per 100 gaskets and 1 ounce (29.6 mL) per inch (25 mm) valve diameter per hour for each valve isolating the tested section. A calibrated container shall be used for pumping as outlined in NFPA 24. The new piping joints will be carefully reviewed during testing.
4. Operating Test: All fire hydrants and control valves shall be operated as outlined in NFPA 24.
5. The fire sprinkler shall receive all underground piping testing and flushing certificates prior to connecting to the aboveground flange within the Wastewater Treatment Building.
6. Wet Pipe Automatic Sprinkler System Testing: The following tests shall be performed for the wet pipe sprinkler system:
7. Hydrostatic Test: The system shall be hydrostatically tested at not less than 200 psi (13.8 bar) for a minimum of two hours in accordance with NFPA 13. The test pressure shall be read from a gauge located at the lowest point of the system. There shall be no visible leakage during the test.
8. System Flow Test: The inspector's test shall be opened. The alarm shall be verified at the local Fire Alarm Panel.
9. Valve Tamper Switch Test: The valve shall be closed two turns or one-fifth of the travel distance to activate the valve tamper switch. The supervisory signal shall be verified at the local Fire Alarm Panel.
10. Main Drain Test: The Contractor shall perform a main drain test in accordance with NFPA 25 and record the results on the Contractor’s Material and Test Certificate.
11. Manual Wet Standpipe System Testing: The following tests shall be performed for the wet pipe sprinkler system:
12. Hydrostatic Test: The system shall be hydrostatically tested at not less than 200 psi (13.8 bar) for a minimum of two hours in accordance with NFPA 14. The test pressure shall be

read from a gauge located at the lowest point of the system. There shall be no visible leakage during the test.

13. System Flow Test: The contractor shall coordinate with the fire department a system flow test utilizing the responding fire apparatus to document actual system pressures at each hose valve.
14. Valve Tamper Switch Test: The valve shall be closed two turns or one-fifth of the travel distance to activate the valve tamper switch. The supervisory signal shall be verified at the local Fire Alarm Panel.

3.15 TRAINING

3.16 Training shall be provided for the operations and maintenance staff. Training shall be conducted in the building where the system is installed or as designated by the Owner. The training period shall be a minimum of two four-hour sessions and shall start after the system is functionally completed but prior to final acceptance tests. The instructions shall cover all the items contained in the operating and maintenance instructions.

END OF SECTION 219000

SECTION 230500 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 ACCURACY OF DATA AND CONTRACT DRAWINGS

A. The design drawings are diagrammatic and they may not show all physical arrangements, offsets, bends, or elbows which may be required for installation of various materials, equipment, piping, and ductwork systems in allotted spaces. The Contractor shall examine these and other available drawings to determine space limitations and interferences. The Contractor shall be responsible for making any minor changes in location of equipment, pipe and ductwork from that shown on drawings and for all physical details required for installation. Cost for adapting Contractor's work to jobsite conditions shall not be considered as basis of an extra cost to contract. The Contractor shall get approval before proceeding with any change.

B. Elevation of piping, ductwork and equipment indicated on drawings are to be used as guidelines to assist Contractor with installations. Minor changes to these elevations may be necessary to eliminate unforeseen interferences. The Contractor shall get approval before proceeding with any changes in elevations.

C. Information pertaining to new and existing conditions that are described in the specifications or appear on drawings are based on available records. While such data has been collected with reasonable care, there is no expressed or implied guarantee that conditions so indicated are entirely representative of those actually existing or that unlooked for developments may not occur. Such information is merely provided to assist the Contractor in his investigation of conditions.

D. The Contractor must carefully examine the drawings, specifications and project site, and verify all measurements, distances, levels, materials, equipment, etc. before starting work.

E. Drawings shall not be scaled for determining exact dimensions or location of equipment.

F. Except as otherwise specified herein or indicated on drawings, furnish and install all piping, tubing, valves, specialties and supports to connect fixtures and equipment into their respective systems as required for or incidental to the proper operation of the indicated systems. This shall include the following systems:

G. All miscellaneous piping called for on piping and instrument diagrams, regardless of whether or not indicated in the specifications or on the drawings. Reference shall be made to piping and instrument diagrams, control air piping drawings, and manufacturer's equipment drawings to determine full extent or required piping.

1.3 SUMMARY

A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Transition fittings.
3. Dielectric fittings.
4. Mechanical sleeve seals.
5. Sleeves.
6. Escutcheons.
7. Grout.
8. HVAC demolition.
9. Equipment installation requirements common to equipment sections.
10. Painting and finishing.
11. Concrete bases.
12. Supports and anchorages.

1.4 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. The following are industry abbreviations for plastic materials:

1. CPVC: Chlorinated polyvinyl chloride plastic.
2. PE: Polyethylene plastic.
3. PVC: Polyvinyl chloride plastic.

G. The following are industry abbreviations for rubber materials:

1. EPDM: Ethylene-propylene-diene terpolymer rubber.
2. NBR: Acrylonitrile-butadiene rubber.

1.5 SUBMITTALS

A. Product Data: None

1.6 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

C. The Contractor or the Contractor’s authorized representative must be present to accept delivery of all equipment and materials furnished by him. The Owner’s personnel will not knowingly accept, unload or store anything delivered to the site for the Contractor’s use. Inadvertent acceptance of delivered items by a representative of the Owner shall not constitute acceptance or responsibility for any of the materials or equipment. It shall be the Contractor’s responsibility to assume all liability for any equipment or materials furnished by him which are delivered to the job site.

D. Storage of materials on the grounds and within the building shall be in strict accordance with instructions of the Owner. Storage of materials within building shall at no time exceed design carrying capacity of the structural system.

E. The Owner assumes no responsibility for materials stored in building or on the site. Each Contractor shall assume full responsibility for all losses or damage due to the storing of his materials.

F. Handle items carefully to avoid damage to components, enclosures and finishes. Follow the manufacturer’s rigging instructions when handling and moving equipment.

1.8 COORDINATION

A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for HVAC installations.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

C. Coordinate requirements for access panels and doors for HVAC items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

1.9 CODES AND REGULATIONS

A. All codes and regulations of state and local authorities shall become part of this specification and must be adhered to where they exceed requirements as shown on the drawings or stated in the specifications, without additional cost to the Contract.

1.10 CONTINUITY OF EXISTING SERVICES

A. Do not interrupt or change existing services without prior written approval. When interruption is required, coordinate length of service time with Owner to minimize disruption of occupant activities.

1.11 OPERATING AND MAINTENANCE INSTRUCTIONS

A. The Contractor shall provide operating and maintenance instruction manuals covering each and every item of equipment and devices furnished or erected by the Contractor prior to "Substantial Completion" as required by Division 1.

B. DESIGNER NOTE: AIR NATIONAL GUARD PROJECTS REQUIRE AT LEAST TWO (2) SETS OF O&M MANUALS AT NO LATER THAN 80% COMPLETION.

C. Each separate manual shall consist of the following:

D. Neatly typewritten table of contents including contractor's name, address and telephone number; list of each product referenced in manual; and name, address and telephone number of installing contractor and maintenance contractor for each product.

E. Tabbed sections of catalog data and literature for each product including model number, description and component parts; operating procedures; maintenance procedures; servicing and lubrication schedules; description of sequence of operations; parts lists; illustrations, assembly drawings and diagrams required for maintenance; any additional drawings, diagrams, charts or written text which may be required to supplement product data for particular installation; certified test and balance report; list of control point labels, and wiring diagrams.

F. Copy of warranty, bond and/or service contract issued for each product including an information sheet for operations personnel with proper procedures in event of a product failure and instances which might affect validity of warranties or bonds.

G. Full size sheets, if required, shall be folded into special holding pockets. Faxed, handwritten, or illegible materials are not acceptable.

H. Prior to final inspection or acceptance, fully instruct designated facility operating and maintenance personnel on operation, adjustment and maintenance of products, equipment and systems. Review contents of operating and maintenance manual with personnel in full detail to explain all aspects of operations and maintenance.

I. Provide a wall mounted mesh style lockable storage cabinet in the mechanical rooms for the O&M manuals.

J. DESIGNER NOTE: MESH CABINET REQUIRED FOR AIR NATIONAL GUARD PROJECTS.

1.12 POSTED OPERATIONS INSTRUCTIONS (POIs)

A. Provide comprehensive posted operations instructions for all equipment and systems. Instructions shall be developed as CADD schematics, files, or plans and include printed text. Information shall include but not limited to air system schematics, water system schematics, equipment schedules, valve charts, controls points list, sequence of operations, and building plan showing equipment locations. They shall be framed under glass with extruded metal frame and shall be bolted to the mechanical room wall. Instructions shall be in color and use color graphics for illustrative purposes.

B. As an alternative to posting in mechanical rooms, POIs may by incorporated into the graphics package of the base central Energy Management and Control System (EMCS).]

1.13 PROTECTION OF ROOF

A. Contractors are cautioned that they must exercise extreme care in any activity involving contact with any installed roof membrane.

B. Construct protective plywood (3/4 in. thick) runways across the roof for moving, setting, and installing equipment and piping systems. No activity on the roof will be permitted without this protection. Start runways at the point of origin of any equipment placed on roof and terminate at the point of installation on curb or base. At completion of work, or when directed by the Owner, completely remove, neatly and cleanly, without damage to roofing system, these protective items and runways.

C. Any and all repairs necessary to bring the roofing system to its original condition shall be made by an approved Roofing Contractor and paid for by the Contractor responsible for the damage

1.14 WORK COORDINATION

A. All Trades shall work in cooperation with each other, and fit their work into the structure as job conditions may demand. All final decisions as to right-of-way and run of pipes and ducts, etc. shall be made by the Owner. In general, priority shall be arranged as follows: (in order of preference)

B. Recessed lighting fixtures

C. Piping which must be drainable

D. Sheet metal ductwork

E. Lighting fixtures

F. Plumbing waste lines, downspouts, vents and sprinkler piping

G. Gravity water lines

H. Heating hot and chilled water lines

I. Refrigerant lines

J. Plumbing water and gas and air lines

K. Electrical conduit

L. Control wiring conduit

1.15 INSPECTION

A. The Contractor shall verify the location of underground service, utilities, structures, etc., which may be encountered or be affected by his work and shall be responsible for any damage caused by neglect to provide proper precautions or protection.

B. Any work that is to be concealed, such as inside walls, above ceilings, soffits, shall be inspected by Owner prior to concealment

1.16 TEMPORARY HVAC

A. Occupied Spaces: Provide temporary heating, ventilation, and air conditioning in occupied areas when HVAC cannot be provided from existing or new systems as designed. A minimum of 0.5 cfm/ft2 ventilation air shall be provided. When heating, the system shall maintain the room temperature at 68°F or warmer. When cooling, the system shall maintain the room temperature at 78°F or cooler and maintain the relative humidity below 60%. Existing systems may be modified to meet these requirements. Direct-fired heaters are not permitted. All temporary HVAC provisions must be approved. Visible portions, such as diffusers, grilles, thermostats, and any exposed ductwork, must also be approved.

B. In normally unoccupied spaces that are only heated, provide temporary heating to maintain the temperature at 55°F or warmer. Use of direct-fired heaters is acceptable, provided ventilation is adequate and condensation is minimized. Any damage from condensation shall be repaired by this contractor at no additional cost to the Contract.

1.17 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

1.18 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

1.19 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
   a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.

2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Steam and steam condensate systems: Spiral wound gasket with external ring to prevent gasket blowout, ASME B16.20. Suitable for use with flat face and raised face flanges. 304 stainless steel/non-asbestos filler/carbon steel outer guide ring,. Filler to be graphite or PTFE on low pressure systems, 900 degree F graphite or ceramic on high pressure steam. Flexitallic Style CG, Leader Style SR, Garlock Flexseal or approved equal.

D. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

E. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

F. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

G. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

H. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

I. Solvent Cements for Joining Plastic Piping:

1. CPVC Piping: ASTM F 493.
2. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

J. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

1.20 TRANSITION FITTINGS

A. Plastic-to-Metal Transition Fittings: CPVC and PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.

1. Available Manufacturers:
   a. Eslon Thermoplastics.

B. Plastic-to-Metal Transition Adaptors: One-piece fitting with manufacturer's SDR 11 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.

1. Available Manufacturers:
   a. Thompson Plastics, Inc.

C. Plastic-to-Metal Transition Unions: MSS SP-107, CPVC and PVC four-part union. Include brass end, solvent-cement-joint end, rubber O-ring, and union nut.

1. Available Manufacturers:
   a. NIBCO INC.

1.21 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).

1. Available Manufacturers:
   a. Capitol Manufacturing Co.

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.

1. Available Manufacturers:
   a. Capitol Manufacturing Co.

E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.

1. Available Manufacturers:
   a. Advance Products & Systems, Inc.

2. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig (1035- or 2070-kPa) minimum working pressure where required to suit system pressures.

F. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

1. Available Manufacturers:
   a. Calpico, Inc.

G. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

1. Available Manufacturers:
   a. Perfection Corp.

1.22 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Available Manufacturers:
   a. Advance Products & Systems, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel . Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

1.23 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with set screws.

E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.

F. PVC Pipe: ASTM D 1785, Schedule 40.

G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

1.24 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Stamped-Steel Type: With spring clips and chrome-plated finish.

D. Split-Plate, Stamped-Steel Type: With concealed hinge, spring clips, and chrome-plated finish.

E. One-Piece, Floor-Plate Type: Cast-iron floor plate.

F. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

1.25 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

1.26 SEALANTS

A. Reference Division 7 specification for sealant requirements

1.27 HVAC DEMOLITION

A. Refer to Division 01 Section "Cutting and Patching" and Division 02 Section "Selective Structure Demolition" for general demolition requirements and procedures.

B. Disconnect, demolish, and remove HVAC systems, equipment, and components indicated to be removed.

1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
5. Equipment to Be Removed: Disconnect and cap services and remove equipment.
6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

D. Removed materials must not be reused unless otherwise specified or directed to be so.

E. Arrange and pay for disconnecting, removing and capping utility services within areas of demolition. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

F. Refrigerant shall be recovered from any refrigeration unit that will be removed or salvaged. Recovered refrigerants must be bottled in pressure containers suitable for shipping per DOT requirement and remain property of the Government. Salvage or disposal by Contractor is not permitted

G. For any existing equipment being relocated and re-installed, the contractor shall test functionality of existing unit and report in writing any functional deficiencies. Failure to submit this report shall imply that the unit is fully functional and will obligate the contractor to repair any discovered deficiencies prior to project closeout. If functionality test report identifies unit deficiencies, the contractor shall notify the Owner and Architect/Engineer immediately.

1.28 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Full lengths of pipe shall be used. Short lengths and couplings will not be permitted.

L.

M. Independently support piping so that its weight shall not be supported by the equipment to which it is connected.

N. Size reduction shall be made using reducing fittings; bushings are not acceptable.

O. Mitered ells, notched tees, and orange peel reducers are not acceptable. On threaded piping, bushings are not acceptable.

P. "Weldolets" and "Threadolets" may be used for branch takeoffs up to one-half (1/2) the diameter of the main.

Q. Cover ends of piping during installation to keep inside of piping clean.

R. Piping shall not be routed through electrical rooms or transformer vaults, or above transformers, panelboards, or switchboards, including the required service space for this equipment, unless the piping is serving this equipment.

S. Use only wrenches having square flat jaws, or non-metallic strap wrenches on brass specialties; wrench marks not permitted.

T. Select system components with pressure rating equal to or greater than system operating pressure.

U. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:

1. New Piping:
   a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.

2. Existing Piping: Use the following:

V. Sleeves are not required for core-drilled holes.

W. Permanent sleeves are not required for holes formed by removable PE sleeves.

X. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.

Y. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

1. Cut sleeves to length for mounting flush with both surfaces.
   a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
3. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
   a. Steel Pipe Sleeves: For pipes smaller than NPS 6 (DN 150).
      1) Seal space outside of sleeve fittings with grout.

4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.

Z. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

AA. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

BB. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

CC. Verify final equipment locations for roughing-in.

DD. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

EE. DESIGNER NOTE: FOLLOWING SECTION IS FOR INDUSTRIAL PROJECTS ONLY

FF.

GG. Vent Piping (aboveground):

HH. Install vent and relief valve discharge lines as indicated on the drawings, as detailed, and as specified for each specific valve or piping specialty item. In no event is a termination to occur less than six feet above a roof line.

1.29 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
3. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
4. PVC Nonpressure Piping: Join according to ASTM D 2855.

J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.

K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.

1. Plain-End Pipe and Fittings: Use butt fusion.
2. Plain-End Pipe and Socket Fittings: Use socket fusion.

1.30 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

1.31 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

1.32 PAINTING

A. Painting of HVAC systems, equipment, and components is specified in Division 09 Sections "Interior Painting" and "Exterior Painting."

B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

1.33 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.

1. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to supported equipment.
6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
7. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 03.

1.34 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 05 Section "Metal Fabrications" for structural steel.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

C. Field Welding: Comply with AWS D1.1.

1.35 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

1.36 GROUTING

A. Mix and install grout for HVAC equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

END OF SECTION 230500

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.2 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:

1. Motor controllers.
2. Torque, speed, and horsepower requirements of the load.
3. Ratings and characteristics of supply circuit and required control sequence.
4. Ambient and environmental conditions of installation location.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.

B. Comply with NEMA MG 1 unless otherwise indicated.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 212 feet above sea level.

B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

B. Efficiency: Energy efficient, as defined in NEMA MG 1.

C. Service Factor: 1.15.

D. Multispeed Motors: Variable torque.

1. For motors with 2:1 speed ratio, consequent pole, single winding.
2. For motors with other than 2:1 speed ratio, separate winding for each speed.

E. Multispeed Motors: Separate winding for each speed.

F. Rotor: Random-wound, squirrel cage.

G. Bearings: Regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

H. Temperature Rise: Match insulation rating.

I. Insulation: Class F.

J. Code Letter Designation:

1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

2.5 SINGLE-PHASE MOTORS

A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:

1. Permanent-split capacitor.
2. Split phase.
3. Capacitor start, inductor run.
4. Capacitor start, capacitor run.

B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

C. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

D. Motors 1/20 HP and Smaller: Shaded-pole type.

E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 230513

SECTION 230548 - VIBRATION AND SEISMIC CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. IBC: International Building Code.

B. ICC-ES: ICC-Evaluation Service.

C. OSHPD: Office of Statewide Health Planning & Development (for the State of California).

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device and seismic-restraint component required.
    a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
    b. Annotate to indicate application of each product submitted and compliance with requirements.

3. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.

B. Shop Drawings:

1. Detail fabrication and assembly of equipment bases. Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal: For each vibration isolation and seismic-restraint device.

1. Include design calculations and details for selecting vibration isolators, seismic restraints, and vibration isolation bases complying with performance requirements, design criteria,

and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

2. Design Calculations: Calculate static and dynamic loading due to equipment weight, operation, and seismic and wind forces required to select vibration isolators and seismic and wind restraints and for designing vibration isolation bases.
   a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

3. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, spring deflection changes, and seismic loads. Include certification that riser system was examined for excessive stress and that none exists.
4. Seismic-Restraint Details:
   a. Design Analysis: To support selection and arrangement of seismic and wind restraints. Include calculations of combined tensile and shear loads.
   b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
   c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.
   d. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Contractor shall submit for approval, seismic restraint calculations, drawings and details to authorities having jurisdiction as required by these authorities.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

1.7 VIBRATION CONTROL DESIGN CRITERIA

A. Isolate all motor driven and reciprocating mechanical equipment unless otherwise noted, from building structure, and from systems which they serve, to prevent equipment vibrations from being transmitted to structure. Unless specifically indicated, follow ASHRAE Application Handbook - Sound and Vibration Control, latest edition or manufacturer's recommendations for isolation selection.

B. Select and locate isolators to produce uniform loading and deflection. Use minimum of four isolators to support each piece of equipment.

C. Select vibration isolation devices based on lowest operating speed.

D. Vibration Criteria:
1. All rotating equipment shall operate at speeds less than 80% of their true critical speed. Unless otherwise required, equipment shall be balanced according to the recommendations given in the following schedules.
2. Vertical vibration of rotating equipment shall not be greater than levels indicated. Vibration shall be measured on equipment or steel-frame equipment base when equipment is mounted on its vibration isolation mounts. If equipment has inertia base, allowable vibration level is reduced by ratio of equipment weight alone to equipment weight plus inertia base weight.
3. Following field installation, each fan over 5 HP shall be balanced in accordance with the following schedule:
   a. Centrifugal fans - 25 mil/sec, rms
4. Final in-field balance shall be measured with each fan over 5 HP installed on springs specified for unit. Fans shall be loaded with design static pressure. Measurement shall be carried out in vertical axis at each corner of frame supporting fan/motor assembly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Wind-Restraint Loading:

1. Basic Wind Speed: See structural drawings.
2. Building Classification Category: See structural drawings.
3. Minimum 10 lb/sq. ft. multiplied by maximum area of HVAC component projected on vertical plane normal to wind direction, and 45 degrees either side of normal.

B. Seismic-Restraint Loading:

1. Site Class as Defined in the IBC: See structural drawings.
2. Assigned Seismic Use Group or Building Category as Defined in the IBC: See structural drawings.
    a. Component Importance Factor: See structural drawings.
    b. Component Response Modification Factor: See structural drawings.
    c. Component Amplification Factor: See structural drawings.
3. Design Spectral Response Acceleration at Short Periods (0.2 Second): See structural drawings.
4. Design Spectral Response Acceleration at 1.0-Second Period: See structural drawings.
5. Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
    a. Structural Safety Factor: See structural drawings.

C. Seismic anchorage and restraints, and all manufactured mechanical equipment shall be designed and installed in accordance with codes and standards as enforced by authorities having jurisdiction. Authorities shall include Owner's insurance company.
1. Design for Seismic Design Category: See structural drawings.
2. Design using Design Spectral Response Acceleration (S_{DS}): See structural drawings.
3. Design for Seismic Hazard Level (SHL): See structural drawings.
4. Design for Seismic Zone: See structural drawings.

D. Contractor shall obtain services of an engineer registered and licensed in State of California to design seismic restraint systems and methods of anchorage to building structure.

E. Supports for suspended equipment weighing 31 pounds or more shall be designed to resist forces of 1.5 times the weight in the downward direction and 0.5 times the weight in all other directions.

2.2 ELASTOMERIC ISOLATION PADS

A. Elastomeric Isolation Pads:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    a. Ace Mountings Co., Inc.
    b. California Dynamics Corporation.
    c. Isolation Technology, Inc.
    d. Kinetics Noise Control, Inc.
    e. Mason Industries, Inc.
    f. Vibration Eliminator Co., Inc.
    g. Vibration Isolation.
    h. Vibration Mountings & Controls, Inc.
2. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.
3. Size: Factory or field cut to match requirements of supported equipment.
4. Infused nonwoven cotton or synthetic fibers.

5. Load-bearing metal plates adhered to pads.

2.3 ELASTOMERIC ISOLATION MOUNTS

A. Double-Deflection, Elastomeric Isolation Mounts:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.
   d. Kinetics Noise Control, Inc.
   e. Mason Industries, Inc.
   f. Vibration Eliminator Co., Inc.
   g. Vibration Isolation.
   h. Vibration Mountings & Controls, Inc.

2. Mounting Plates:
   a. Top Plate: Encapsulated steel load transfer top plates, factory drilled and threaded.
   b. Baseplate: Encapsulated steel bottom plates with holes provided for anchoring to support structure.

3. Elastomeric Material: Molded, oil-resistant rubber, neoprene, or other elastomeric material.

2.4 RESTRAINED ELASTOMERIC ISOLATION MOUNTS

A. Restrained Elastomeric Isolation Mounts:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.
   d. Kinetics Noise Control, Inc.
   e. Mason Industries, Inc.
   f. Vibration Eliminator Co., Inc.
   g. Vibration Isolation.
   h. Vibration Mountings & Controls, Inc.

2. Description: All-directional isolator with seismic restraints containing two separate and opposing elastomeric elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
   a. Housing: Cast-ductile iron or welded steel.
   b. Elastomeric Material: Molded, oil-resistant rubber, neoprene, or other elastomeric material.

2.5 OPEN-SPRING ISOLATORS

A. Freestanding, Laterally Stable, Open-Spring Isolators:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.
   d. Kinetics Noise Control, Inc.
   e. Mason Industries, Inc.
   f. Vibration Eliminator Co., Inc.
   g. Vibration Isolation.
   h. Vibration Mountings & Controls, Inc.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Baseplates: Factory-drilled steel plate for bolting to structure with an elastomeric isolator pad attached to the underside. Baseplates shall limit floor load to 500 psig.
7. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

2.6 HOUSED-SPRING ISOLATORS

A. Freestanding, Laterally Stable, Open-Spring Isolators in Two-Part Telescoping Housing:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.
   d. Kinetics Noise Control, Inc.
   e. Mason Industries, Inc.
   f. Vibration Eliminator Co., Inc.
   g. Vibration Isolation.
   h. Vibration Mountings & Controls, Inc.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

6. Two-Part Telescoping Housing: A steel top and bottom frame separated by an elastomeric material and enclosing the spring isolators.
   a. Drilled base housing for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.
   b. Top housing with attachment and leveling bolt, threaded mounting holes and internal leveling device, or elastomeric pad.

2.7 RESTRAINED-SPRING ISOLATORS

A. Freestanding, Laterally Stable, Open-Spring Isolators with Vertical-Limit Stop Restraint:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.
   d. Kinetics Noise Control, Inc.
   e. Mason Industries, Inc.
   f. Vibration Eliminator Co., Inc.
   g. Vibration Isolation.
   h. Vibration Mountings & Controls, Inc.

2. Housing: Steel housing with vertical-limit stops to prevent spring extension due to weight being removed.
   a. Base with holes for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.
   b. Top plate with threaded mounting holes.
   c. Internal leveling bolt that acts as blocking during installation.

3. Restraint: Limit stop as required for equipment and authorities having jurisdiction.
4. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
5. Minimum Additional Travel: 50 percent of the required deflection at rated load.
6. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
7. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.8 HOUSED-RESTRAINED-SPRING ISOLATORS

A. Freestanding, Steel, Open-Spring Isolators with Vertical-Limit Stop Restraint in Two-Part Telescoping Housing:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.

d. Kinetics Noise Control, Inc.
e. Mason Industries, Inc.
f. Vibration Eliminator Co., Inc.
g. Vibration Isolation.
h. Vibration Mountings & Controls, Inc.

2. Two-Part Telescoping Housing: A steel top and bottom frame separated by an elastomeric material and enclosing the spring isolators. Housings are equipped with [adjustable] [non-adjustable] snubbers to limit vertical movement.
   a. Drilled base housing for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.
   b. Threaded top housing with adjustment bolt and cap screw to fasten and level equipment.

3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.9 ELASTOMERIC HANGERS

A. Elastomeric Mount in a Steel Frame with Upper and Lower Steel Hanger Rods:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Ace Mountings Co., Inc.
   b. California Dynamics Corporation.
   c. Isolation Technology, Inc.
   d. Kinetics Noise Control, Inc.
   e. Mason Industries, Inc.
   f. Vibration Eliminator Co., Inc.
   g. Vibration Mountings & Controls, Inc.

2. Frame: Steel, fabricated with a connection for an upper threaded hanger rod and an opening on the underside to allow for a maximum of 30 degrees of angular lower hanger-rod misalignment without binding or reducing isolation efficiency.
3. Dampening Element: Molded, oil-resistant rubber, neoprene, or other elastomeric material with a projecting bushing for the underside opening preventing steel to steel contact.

2.10 SPRING HANGERS

A. Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Ace Mountings Co., Inc.
b. California Dynamics Corporation.
c. Kinetics Noise Control, Inc.
d. Mason Industries, Inc.
e. Vibration Eliminator Co., Inc.
f. Vibration Isolation.
g. Vibration Mountings & Controls, Inc.

2. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
7. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
8. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
9. Self-centering hanger-rod cap to ensure concentricity between hanger rod and support spring coil.

2.11 SNUBBERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Kinetics Noise Control, Inc.
2. Mason Industries, Inc.
3. Vibration Mountings & Controls, Inc.

B. Description: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.

1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.
2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
3. Maximum 1/4-inch air gap, and minimum 1/4-inch- thick resilient cushion.

2.12 RESTRAINT CHANNEL BRACINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper B-Line, Inc.
2. Hilti, Inc.

3. Mason Industries, Inc.
4. Unistrut.

B. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.13 RESTRAINT CABLES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Kinetics Noise Control, Inc.
2. Loos & Co., Inc.
3. Vibration Mountings & Controls, Inc.

B. Restraint Cables: ASTM A 603 galvanized-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.14 SEISMIC-RESTRAINT ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper B-Line, Inc.
2. Kinetics Noise Control, Inc.
3. Mason Industries, Inc.
4. TOLCO.

B. Hanger-Rod Stiffener: Reinforcing steel angle clamped to hanger rod.

C. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

D. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchor bolts and studs.

E. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices used.

F. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.15 MECHANICAL ANCHOR BOLTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper B-Line, Inc.
2. Hilti, Inc.
3. Kinetics Noise Control, Inc.
4. Mason Industries, Inc.

B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.16 ADHESIVE ANCHOR BOLTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Hilti, Inc.
2. Kinetics Noise Control, Inc.
3. Mason Industries, Inc.

B. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.17 VIBRATION ISOLATION EQUIPMENT BASES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. California Dynamics Corporation.
2. Kinetics Noise Control.
3. Mason Industries, Inc.
4. Vibration Eliminator Co., Inc.
5. Vibration Isolation.
6. Vibration Mountings & Controls, Inc.

B. Steel Rails: Factory-fabricated, welded, structural-steel rails.

1. Design Requirements: Lowest possible mounting height with not less than 1-inch clearance above the floor. Include equipment anchor bolts and auxiliary motor slide rails.

2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Rails shall have shape to accommodate supported equipment.

3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.

C. Steel Bases: Factory-fabricated, welded, structural-steel bases and rails.

1. Design Requirements: Lowest possible mounting height with not less than 1-inch clearance above the floor. Include equipment anchor bolts and auxiliary motor slide bases or rails.

2. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Bases shall have shape to accommodate supported equipment.
3. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.

4. Structural Steel: Steel shapes, plates, and bars complying with ASTM A 36/A 36M. Bases shall have shape to accommodate supported equipment.
5. Support Brackets: Factory-welded steel brackets on frame for outrigger isolation mountings and to provide for anchor bolts and equipment support.
6. Fabrication: Fabricate steel templates to hold equipment anchor-bolt sleeves and anchors in place during placement of concrete. Obtain anchor-bolt templates from supported equipment manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic[- and wind]-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.3 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Division 03.

B. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.

C. Comply with requirements in Division 07 for installation of roof curbs, equipment supports, and roof penetrations.

D. Equipment Restraints:

1. Install seismic snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.

E. Install cables so they do not bend across edges of adjacent equipment or building structure.

F. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.

G. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

H. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

I. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

J. Drilled-in Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole

and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque, using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

K. If modifications of pipe and/or equipment locations are required for seismic restraint system, obtain written approval before execution of work.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least [four] <Insert number> of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.
6. Measure isolator restraint clearance.
7. Measure isolator deflection.
8. Verify snubber minimum clearances.
9. Test and adjust restrained-air-spring isolator controls and safeties.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

3.6 VIBRATION ISOLATION EQUIPMENT BASES INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Division 03.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Balancing Air Systems:
   a. Constant-volume air systems.
   b. Dual-duct systems.
   c. Variable-air-volume systems.
   d. Multizone systems.
   e. Induction-unit systems.

2. Balancing Hydronic Piping Systems:
   a. Constant-flow hydronic systems.
   b. Variable-flow hydronic systems.
   c. Primary-secondary hydronic systems.

1.3 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.4 ACTION SUBMITTALS

A. Qualification Data: Within **30**days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

B. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.

1.5 INFORMATIONAL SUBMITTALS

A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

B. Certified TAB reports.

C. Sample report forms.

D. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

1.6 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC, NEBB or TABB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC, NEBB or TABB.
2. TAB Technician: Employee of the TAB contractor and who is certified by AABC, NEBB or TABB as a TAB technician.

B. TAB Conference: Meet with Owner on approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Require the participation of the TAB field supervisor and technicians. Provide seven days' advance notice of scheduled meeting time and location.

1. Agenda Items:
   a. The Contract Documents examination report.
   b. The TAB plan.
   c. Coordination and cooperation of trades and subcontractors.
   d. Coordination of documentation and communication flow.

C. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

D. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.7 PROJECT CONDITIONS

A. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

B. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.8 COORDINATION

A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section " Metal Ducts " and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. After testing and balancing, install test ports and duct access doors that comply with requirements in Division 23 Section "Air Duct Accessories."
3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP**)** units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling-unit components.

L. Verify that air duct system is sealed as specified in Division 23 Section "Metal Ducts."

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure total airflow.
   a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.

2. Measure fan static pressures as follows to determine actual static pressure:
   a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
   b. Measure static pressure directly at the fan outlet or through the flexible connection.
   c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
   d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
   a. Report the cleanliness status of filters and the time static pressures are measured.

4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
6. Obtain approval from Owner for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in Division 23 Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.
   a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

C. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 PROCEDURES FOR DUAL-DUCT SYSTEMS

A. Verify that the cooling coil is capable of full-system airflow, and set mixing boxes at full-cold airflow position for fan volume.

B. Measure static pressure in both hot and cold ducts at the end of the longest duct run to determine that sufficient static pressure exists to operate controls of mixing boxes and to overcome resistance in the ducts and outlets downstream from mixing boxes.

1. If insufficient static pressure exists, increase airflow at the fan.

C. Test and adjust the constant-volume mixing boxes as follows:

1. Verify both hot and cold operations by adjusting the thermostat and observing changes in air temperature and volume.
2. Verify sufficient inlet static pressure before making volume adjustments.
3. Adjust mixing boxes to indicated airflows within specified tolerances. Measure airflow by Pitot-tube traverse readings or by measuring static pressure at mixing-box taps if provided by mixing-box manufacturer.

D. Do not overpressurize ducts.

E. Remeasure static pressure in both hot and cold ducts at the end of the longest duct run to determine that sufficient static pressure exists to operate controls of mixing boxes and to overcome resistance in the ducts and outlets downstream from mixing boxes.

F. Adjust variable-air-volume, dual-duct systems in the same way as constant-volume, dual-duct systems; adjust maximum- and minimum-airflow setting of each mixing box.

3.7 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

A. Compensating for Diversity: When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a minimum set-point airflow with the remainder at maximum-airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced-airflow terminal units so they are distributed evenly among the branch ducts.

B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set outdoor-air dampers at minimum, and set return- and exhaust-air dampers at a position that simulates full-cooling load.
2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
3. Measure total system airflow. Adjust to within indicated airflow.
4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow the same as described for constant-volume air systems.
    a. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.
6. Remeasure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
    a. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.
7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that adequate static pressure is maintained at the most critical unit.
8. Record final fan-performance data.

C. Pressure-Dependent, Variable-Air-Volume Systems without Diversity: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Balance variable-air-volume systems the same as described for constant-volume air systems.
2. Set terminal units and supply fan at full-airflow condition.
3. Adjust inlet dampers of each terminal unit to indicated airflow and verify operation of the static-pressure controller. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
4. Readjust fan airflow for final maximum readings.
5. Measure operating static pressure at the sensor that controls the supply fan if one is installed, and verify operation of the static-pressure controller.

6. Set supply fan at minimum airflow if minimum airflow is indicated. Measure static pressure to verify that it is being maintained by the controller.
7. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow the same as described for constant-volume air systems.
    a. If air outlets are out of balance at minimum airflow, report the condition but leave the outlets balanced for maximum airflow.

8. Measure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.
    a. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.

D. Pressure-Dependent, Variable-Air-Volume Systems with Diversity: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set system at maximum indicated airflow by setting the required number of terminal units at minimum airflow. Select the reduced-airflow terminal units so they are distributed evenly among the branch ducts.
2. Adjust supply fan to maximum indicated airflow with the variable-airflow controller set at maximum airflow.
3. Set terminal units at full-airflow condition.
4. Adjust terminal units starting at the supply-fan end of the system and continuing progressively to the end of the system. Adjust inlet dampers of each terminal unit to indicated airflow. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
5. Adjust terminal units for minimum airflow.
6. Measure static pressure at the sensor.
7. Measure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.

3.8 PROCEDURES FOR MULTIZONE SYSTEMS

A. Set unit at maximum airflow through the cooling coil.

B. Adjust each zone's balancing damper to achieve indicated airflow within the zone.

3.9 PROCEDURES FOR INDUCTION-UNIT SYSTEMS

A. Balance primary-air risers by measuring static pressure at the nozzles of the top and bottom units of each riser to determine which risers must be throttled. Adjust risers to indicated airflow within specified tolerances.

B. Adjust each induction unit.

3.10 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.

B. Prepare schematic diagrams of systems' "as-built" piping layouts.

C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:

1. Open all manual valves for maximum flow.
2. Check liquid level in expansion tank.
3. Check makeup water-station pressure gage for adequate pressure for highest vent.
4. Check flow-control valves for specified sequence of operation, and set at indicated flow.
5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
6. Set system controls so automatic valves are wide open to heat exchangers.
7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
8. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.11 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

A. Measure water flow at pumps. Use the following procedures except for positive-displacement pumps:

1. Verify impeller size by operating the pump with the discharge valve closed. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
   a. If impeller sizes must be adjusted to achieve pump performance, obtain approval from Owner and comply with requirements in Division 23 Section "Hydronic Pumps."

2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve. Adjust pump discharge valve until indicated water flow is achieved.
   a. Monitor motor performance during procedures and do not operate motors in overload conditions.

3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
4. Report flow rates that are not within plus or minus 10 percent of design.

B. Measure flow at all automatic flow control valves to verify that valves are functioning as designed.

C. Measure flow at all pressure-independent characterized control valves, with valves in fully open position, to verify that valves are functioning as designed.

D. Set calibrated balancing valves, if installed, at calculated presettings.

E. Measure flow at all stations and adjust, where necessary, to obtain first balance.

1. System components that have Cv rating or an accurately cataloged flow-pressure-drop relationship may be used as a flow-indicating device.

F. Measure flow at main balancing station and set main balancing device to achieve flow that is 5 percent greater than indicated flow.

G. Adjust balancing stations to within specified tolerances of indicated flow rate as follows:

1. Determine the balancing station with the highest percentage over indicated flow.
2. Adjust each station in turn, beginning with the station with the highest percentage over indicated flow and proceeding to the station with the lowest percentage over indicated flow.
3. Record settings and mark balancing devices.

H. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures including outdoor-air temperature.

I. Measure the differential-pressure-control-valve settings existing at the conclusion of balancing.

J. Check settings and operation of each safety valve. Record settings.

3.12 PROCEDURES FOR VARIABLE-FLOW HYDRONIC SYSTEMS

A. Balance systems with automatic two- and three-way control valves by setting systems at maximum flow through heat-exchange terminals and proceed as specified above for hydronic systems.

3.13 PROCEDURES FOR PRIMARY-SECONDARY HYDRONIC SYSTEMS

A. Balance the primary circuit flow first and then balance the secondary circuits.

3.14 PROCEDURES FOR STEAM SYSTEMS

A. Measure and record upstream and downstream pressure of each piece of equipment.

B. Measure and record upstream and downstream steam pressure of pressure-reducing valves.

C. Check settings and operation of automatic temperature-control valves, self-contained control valves, and pressure-reducing valves. Record final settings.

D. Check settings and operation of each safety valve. Record settings.

E. Verify the operation of each steam trap.

3.15 PROCEDURES FOR HEAT EXCHANGERS

A. Measure water flow through all circuits.

B. Adjust water flow to within specified tolerances.

C. Measure inlet and outlet water temperatures.

D. Measure inlet steam pressure.

E. Check settings and operation of safety and relief valves. Record settings.

3.16 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer's name, model number, and serial number.
2. Motor horsepower rating.
3. Motor rpm.
4. Efficiency rating.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.17 PROCEDURES FOR CHILLERS

A. Balance water flow through each evaporator to within specified tolerances of indicated flow with all pumps operating. With only one chiller operating in a multiple chiller installation, do not exceed the flow for the maximum tube velocity recommended by the chiller manufacturer. Measure and record the following data with each chiller operating at design conditions:

1. Evaporator-water entering and leaving temperatures, pressure drop, and water flow.
2. For water-cooled chillers, condenser-water entering and leaving temperatures, pressure drop, and water flow.
3. Evaporator and condenser refrigerant temperatures and pressures, using instruments furnished by chiller manufacturer.
4. Power factor if factory-installed instrumentation is furnished for measuring kilowatts.
5. Kilowatt input if factory-installed instrumentation is furnished for measuring kilowatts.
6. Capacity: Calculate in tons of cooling.
7. For air-cooled chillers, verify condenser-fan rotation and record fan and motor data including number of fans and entering- and leaving-air temperatures.

3.18 PROCEDURES FOR COOLING TOWERS

A. Shut off makeup water for the duration of the test, and verify that makeup and blowdown systems are fully operational after tests and before leaving the equipment. Perform the following tests and record the results:

1. Measure condenser-water flow to each cell of the cooling tower.
2. Measure entering- and leaving-water temperatures.
3. Measure wet- and dry-bulb temperatures of entering air.
4. Measure wet- and dry-bulb temperatures of leaving air.
5. Measure condenser-water flow rate recirculating through the cooling tower.
6. Measure cooling-tower spray pump discharge pressure.
7. Adjust water level and feed rate of makeup water system.
8. Measure flow through bypass.

3.19 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.

B. Measure entering- and leaving-air temperatures.

C. Record compressor data.

3.20 PROCEDURES FOR BOILERS

A. Hydronic Boilers: Measure and record entering- and leaving-water temperatures and water flow.

B. Steam Boilers: Measure and record entering-water temperature and flow and leaving-steam pressure, temperature, and flow.

3.21 PROCEDURES FOR HEAT-TRANSFER COILS

A. Measure, adjust, and record the following data for each water coil:

1. Entering- and leaving-water temperature.
2. Water flow rate.
3. Water pressure drop.
4. Dry-bulb temperature of entering and leaving air.
5. Wet-bulb temperature of entering and leaving air for cooling coils.
6. Airflow.
7. Air pressure drop.

B. Measure, adjust, and record the following data for each electric heating coil:

1. Nameplate data.
2. Airflow.
3. Entering- and leaving-air temperature at full load.
4. Voltage and amperage input of each phase at full load and at each incremental stage.

5. Calculated kilowatt at full load.
6. Fuse or circuit-breaker rating for overload protection.

C. Measure, adjust, and record the following data for each steam coil:

1. Dry-bulb temperature of entering and leaving air.
2. Airflow.
3. Air pressure drop.
4. Inlet steam pressure.

D. Measure, adjust, and record the following data for each refrigerant coil:

1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.
5. Refrigerant suction pressure and temperature.

3.22 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the refrigerant charge.
4. Check the condition of filters.
5. Check the condition of coils.
6. Check the operation of the drain pan and condensate-drain trap.
7. Check bearings and other lubricated parts for proper lubrication.
8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.
5. Bearings and other parts are properly lubricated.
6. Deficiencies noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows and determine the new fan speed and the face velocity of filters and coils.

2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the air flow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
4. Balance each air outlet.

3.23 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
2. Air Outlets and Inlets: Plus or minus 10 percent.
3. Heating-Water Flow Rate: Plus or minus 10 percent.
4. Cooling-Water Flow Rate: Plus or minus 10 percent.

3.24 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare biweekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.25 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.
12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:
    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Water and steam flow rates.
3. Duct, outlet, and inlet sizes.
4. Pipe and valve sizes and locations.
5. Terminal units.
6. Balancing stations.
7. Position of balancing devices.

E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:
    a. Unit identification.
    b. Location.
    c. Make and type.
    d. Model number and unit size.
    e. Manufacturer's serial number.

f. Unit arrangement and class.
g. Discharge arrangement.
h. Sheave make, size in inches, and bore.
i. Center-to-center dimensions of sheave, and amount of adjustments in inches.
j. Number, make, and size of belts.
k. Number, type, and size of filters.

2. Motor Data:
a. Motor make, and frame type and size.
b. Horsepower and rpm.
c. Volts, phase, and hertz.
d. Full-load amperage and service factor.
e. Sheave make, size in inches, and bore.
f. Center-to-center dimensions of sheave, and amount of adjustments in inches.

3. Test Data (Indicated and Actual Values):
a. Total air flow rate in cfm.
b. Total system static pressure in inches wg.
c. Fan rpm.
d. Discharge static pressure in inches wg.
e. Filter static-pressure differential in inches wg.
f. Preheat-coil static-pressure differential in inches wg.
g. Cooling-coil static-pressure differential in inches wg.
h. Heating-coil static-pressure differential in inches wg.
i. Outdoor airflow in cfm.
j. Return airflow in cfm.
k. Outdoor-air damper position.
l. Return-air damper position.
m. Vortex damper position.

F. Apparatus-Coil Test Reports:

1. Coil Data:
a. System identification.
b. Location.
c. Coil type.
d. Number of rows.
e. Fin spacing in fins per inch o.c.
f. Make and model number.
g. Face area in sq. ft..
h. Tube size in NPS.
i. Tube and fin materials.
j. Circuiting arrangement.

2. Test Data (Indicated and Actual Values):
a. Air flow rate in cfm.
b. Average face velocity in fpm.
c. Air pressure drop in inches wg.
d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
e. Return-air, wet- and dry-bulb temperatures in deg F.
f. Entering-air, wet- and dry-bulb temperatures in deg F.

g. Leaving-air, wet- and dry-bulb temperatures in deg F.
h. Water flow rate in gpm.
i. Water pressure differential in feet of head or psig.
j. Entering-water temperature in deg F.
k. Leaving-water temperature in deg F.
l. Refrigerant expansion valve and refrigerant types.
m. Refrigerant suction pressure in psig.
n. Refrigerant suction temperature in deg F.
o. Inlet steam pressure in psig.

G. Gas- and Oil-Fired Heat Apparatus Test Reports: In addition to manufacturer's factory startup equipment reports, include the following:

1. Unit Data:
   a. System identification.
   b. Location.
   c. Make and type.
   d. Model number and unit size.
   e. Manufacturer's serial number.
   f. Fuel type in input data.
   g. Output capacity in Btu/h.
   h. Ignition type.
   i. Burner-control types.
   j. Motor horsepower and rpm.
   k. Motor volts, phase, and hertz.
   l. Motor full-load amperage and service factor.
   m. Sheave make, size in inches, and bore.
   n. Center-to-center dimensions of sheave, and amount of adjustments in inches.

2. Test Data (Indicated and Actual Values):
   a. Total air flow rate in cfm.
   b. Entering-air temperature in deg F.
   c. Leaving-air temperature in deg F.
   d. Air temperature differential in deg F.
   e. Entering-air static pressure in inches wg.
   f. Leaving-air static pressure in inches wg.
   g. Air static-pressure differential in inches wg.
   h. Low-fire fuel input in Btu/h.
   i. High-fire fuel input in Btu/h.
   j. Manifold pressure in psig.
   k. High-temperature-limit setting in deg F.
   l. Operating set point in Btu/h.
   m. Motor voltage at each connection.
   n. Motor amperage for each phase.
   o. Heating value of fuel in Btu/h.

H. Electric-Coil Test Reports: For electric furnaces, duct coils, and electric coils installed in central-station air-handling units, include the following:

1. Unit Data:
   a. System identification.

b. Location.
c. Coil identification.
d. Capacity in Btu/h.
e. Number of stages.
f. Connected volts, phase, and hertz.
g. Rated amperage.
h. Air flow rate in cfm.
i. Face area in sq. ft..
j. Minimum face velocity in fpm.

2. Test Data (Indicated and Actual Values):
a. Heat output in Btu/h.
b. Air flow rate in cfm.
c. Air velocity in fpm.
d. Entering-air temperature in deg F.
e. Leaving-air temperature in deg F.
f. Voltage at each connection.
g. Amperage for each phase.

I. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:
a. System identification.
b. Location.
c. Make and type.
d. Model number and size.
e. Manufacturer's serial number.
f. Arrangement and class.
g. Sheave make, size in inches, and bore.
h. Center-to-center dimensions of sheave, and amount of adjustments in inches.

2. Motor Data:
a. Motor make, and frame type and size.
b. Horsepower and rpm.
c. Volts, phase, and hertz.
d. Full-load amperage and service factor.
e. Sheave make, size in inches, and bore.
f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
g. Number, make, and size of belts.

3. Test Data (Indicated and Actual Values):
a. Total airflow rate in cfm.
b. Total system static pressure in inches wg.
c. Fan rpm.
d. Discharge static pressure in inches wg.
e. Suction static pressure in inches wg.

J. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

a. System and air-handling-unit number.
b. Location and zone.
c. Traverse air temperature in deg F.
d. Duct static pressure in inches wg.
e. Duct size in inches.
f. Duct area in sq. ft..
g. Indicated air flow rate in cfm.
h. Indicated velocity in fpm.
i. Actual air flow rate in cfm.
j. Actual average velocity in fpm.
k. Barometric pressure in psig.

K. Air-Terminal-Device Reports:

1. Unit Data:
   a. System and air-handling unit identification.
   b. Location and zone.
   c. Apparatus used for test.
   d. Area served.
   e. Make.
   f. Number from system diagram.
   g. Type and model number.
   h. Size.
   i. Effective area in sq. ft..

2. Test Data (Indicated and Actual Values):
   a. Air flow rate in cfm.
   b. Air velocity in fpm.
   c. Preliminary air flow rate as needed in cfm.
   d. Preliminary velocity as needed in fpm.
   e. Final air flow rate in cfm.
   f. Final velocity in fpm.
   g. Space temperature in deg F.

L. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:

1. Unit Data:
   a. System and air-handling-unit identification.
   b. Location and zone.
   c. Room or riser served.
   d. Coil make and size.
   e. Flowmeter type.

2. Test Data (Indicated and Actual Values):
   a. Air flow rate in cfm.
   b. Entering-water temperature in deg F.
   c. Leaving-water temperature in deg F.
   d. Water pressure drop in feet of head or psig.
   e. Entering-air temperature in deg F.
   f. Leaving-air temperature in deg F.

M. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:

1. Unit Data:
   a. Unit identification.
   b. Location.
   c. Service.
   d. Make and size.
   e. Model number and serial number.
   f. Water flow rate in gpm.
   g. Water pressure differential in feet of head or psig.
   h. Required net positive suction head in feet of head or psig.
   i. Pump rpm.
   j. Impeller diameter in inches.
   k. Motor make and frame size.
   l. Motor horsepower and rpm.
   m. Voltage at each connection.
   n. Amperage for each phase.
   o. Full-load amperage and service factor.
   p. Seal type.

2. Test Data (Indicated and Actual Values):
   a. Static head in feet of head or psig.
   b. Pump shutoff pressure in feet of head or psig.
   c. Actual impeller size in inches.
   d. Full-open flow rate in gpm.
   e. Full-open pressure in feet of head or psig.
   f. Final discharge pressure in feet of head or psig.
   g. Final suction pressure in feet of head or psig.
   h. Final total pressure in feet of head or psig.
   i. Final water flow rate in gpm.
   j. Voltage at each connection.
   k. Amperage for each phase.

N. Instrument Calibration Reports:

1. Report Data:
   a. Instrument type and make.
   b. Serial number.
   c. Application.
   d. Dates of use.
   e. Dates of calibration.

3.26 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.

2. Check the following for each system:
   a. Measure airflow of at least 10 percent of air outlets.
   b. Measure water flow of at least 5 percent of terminals.
   c. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.
   d. Verify that balancing devices are marked with final balance position.
   e. Note deviations from the Contract Documents in the final report.

B. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Owner.
2. The TAB contractor's test and balance engineer shall conduct the inspection in the presence of Owner.
3. Owner shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.
4. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails, proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB contractor to complete TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB contractor's final payment.

D. Prepare test and inspection reports.

3.27 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 230593

SECTION 230700 - HVAC INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 ACTION SUBMITTALS

A. Qualification Data: For qualified Installer.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application, duct Installer for duct insulation application, and equipment Installer for equipment insulation application. Before preparing piping and ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. See drawing schedule(s) for insulation material specifications

2.2 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Insulco, Division of MFS, Inc.; Triple I.
   b. P. K. Insulation Mfg. Co., Inc.; Super-Stik.

B. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Insulco, Division of MFS, Inc.; SmoothKote.
   b. P. K. Insulation Mfg. Co., Inc.; PK No. 127, and Quik-Cote.
   c. Rock Wool Manufacturing Company; Delta One Shot.

2.3 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Polyisocyanurate Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-96.
   b. Foster Products Corporation, H. B. Fuller Company; 81-33.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Aeroflex USA Inc.; Aeroseal.
   b. Armacell LCC; 520 Adhesive.
   c. Foster Products Corporation, H. B. Fuller Company; 85-75.
   d. RBX Corporation; Rubatex Contact Adhesive.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-82.
   b. Foster Products Corporation, H. B. Fuller Company; 85-20.
   c. ITW TACC, Division of Illinois Tool Works; S-90/80.
   d. Marathon Industries, Inc.; 225.
   e. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-82.
   b. Foster Products Corporation, H. B. Fuller Company; 85-20.
   c. ITW TACC, Division of Illinois Tool Works; S-90/80.
   d. Marathon Industries, Inc.; 225.
   e. Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Dow Chemical Company (The); 739, Dow Silicone.
   b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
   c. P.I.C. Plastics, Inc.; Welding Adhesive.
   d. Speedline Corporation; Speedline Vinyl Adhesive.

2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-35.
   b. Foster Products Corporation, H. B. Fuller Company; 30-90.
   c. ITW TACC, Division of Illinois Tool Works; CB-50.
   d. Marathon Industries, Inc.; 590.
   e. Mon-Eco Industries, Inc.; 55-40.
   f. Vimasco Corporation; 749.

2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: White.

C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below ambient services.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-30.
   b. Foster Products Corporation, H. B. Fuller Company; 30-35.
   c. ITW TACC, Division of Illinois Tool Works; CB-25.
   d. Marathon Industries, Inc.; 501.
   e. Mon-Eco Industries, Inc.; 55-10.

2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
3. Service Temperature Range: 0 to 180 deg F.
4. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
5. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below ambient services.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; Encacel.
   b. Foster Products Corporation, H. B. Fuller Company; 60-95/60-96.
   c. Marathon Industries, Inc.; 570.
   d. Mon-Eco Industries, Inc.; 55-70.

2. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 30-mil dry film thickness.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Solids Content: ASTM D 1644, 33 percent by volume and 46 percent by weight.
5. Color: White.

E. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-10.
   b. Foster Products Corporation, H. B. Fuller Company; 35-00.
   c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
   d. Marathon Industries, Inc.; 550.
   e. Mon-Eco Industries, Inc.; 55-50.
   f. Vimasco Corporation; WC-1/WC-5.

2. Water-Vapor Permeance: ASTM F 1249, 3 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: Minus 20 to plus 200 deg F.
4. Solids Content: 63 percent by volume and 73 percent by weight.
5. Color: White.

2.5 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-52.
   b. Foster Products Corporation, H. B. Fuller Company; 81-42.
   c. Marathon Industries, Inc.; 130.
   d. Mon-Eco Industries, Inc.; 11-30.
   e. Vimasco Corporation; 136.

3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over duct, equipment, and pipe insulation.
4. Service Temperature Range: Minus 50 to plus 180 deg F.
5. Color: White.

2.6 SEALANTS

A. Joint Sealants:

1. Joint Sealants for Polyisocyanurate Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-76.
   b. Foster Products Corporation, H. B. Fuller Company; 30-45.
   c. Marathon Industries, Inc.; 405.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. Pittsburgh Corning Corporation; Pittseal 444.
   f. Vimasco Corporation; 750.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Permanently flexible, elastomeric sealant.
4. Service Temperature Range: Minus 100 to plus 300 deg F.
5. Color: White or gray.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. FSK and Metal Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-76-8.
   b. Foster Products Corporation, H. B. Fuller Company; 95-44.
   c. Marathon Industries, Inc.; 405.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. Vimasco Corporation; 750.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products, Division of ITW; CP-76.

2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.7 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.8 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. See drawing schedule for field-applied jacket material specifications

2.9 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
   b. Compac Corp.; 104 and 105.
   c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
   d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.

7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
   b. Compac Corp.; 110 and 111.
   c. Ideal Tape Co., Inc., an American Biltrite Company; 491 AWF FSK.
   d. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ.

2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive. Suitable for indoor and outdoor applications.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0555.
   b. Compac Corp.; 130.
   c. Ideal Tape Co., Inc., an American Biltrite Company; 370 White PVC tape.
   d. Venture Tape; 1506 CW NS.

2. Width: 2 inches.
3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

D. PVDC Tape for Indoor Applications: White vapor-retarder PVDC tape with acrylic adhesive.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Dow Chemical Company (The); Saran 540 Vapor Retarder Tape.

2. Width: 3 inches.
3. Film Thickness: 4 mils.
4. Adhesive Thickness: 1.5 mils.
5. Elongation at Break: 145 percent.
6. Tensile Strength: 55 lbf/inch in width.

E. PVDC Tape for Outdoor Applications: White vapor-retarder PVDC tape with acrylic adhesive.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Chemical Company (The); Saran 560 Vapor Retarder Tape.

2. Width: 3 inches.
3. Film Thickness: 6 mils.
4. Adhesive Thickness: 1.5 mils.
5. Elongation at Break: 145 percent.
6. Tensile Strength: 55 lbf/inch in width.

2.10 SECUREMENTS

A. Bands:

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Childers Products; Bands.
   b. PABCO Metals Corporation; Bands.
   c. RPR Products, Inc.; Bands.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing seal .
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal .
4. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Insulation Pins and Hangers:

1. Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch- [**0.135-inch-**] diameter shank, length to suit depth of insulation indicated.
   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      1) AGM Industries, Inc.; CWP-1.
      2) GEMCO; CD.
      3) Midwest Fasteners, Inc.; CD.
      4) Nelson Stud Welding; TPA, TPC, and TPS.

2. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch- diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
   a. Products: Subject to compliance with requirements, :
      1) AGM Industries, Inc.; CWP-1.
      2) GEMCO; Cupped Head Weld Pin.
      3) Midwest Fasteners, Inc.; Cupped Head.
      4) Nelson Stud Welding; CHP.

3. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series T.
   2) GEMCO; Perforated Base.
   3) Midwest Fasteners, Inc.; Spindle.
b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
c. Spindle: Copper- or zinc-coated, low carbon steel , fully annealed, 0.106-inch- diameter shank, length to suit depth of insulation indicated.
d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

4. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      1) GEMCO; Nylon Hangers.
      2) Midwest Fasteners, Inc.; Nylon Insulation Hangers.
   b. Baseplate: Perforated, nylon sheet, 0.030 inch thick by 1-1/2 inches in diameter.
   c. Spindle: Nylon, 0.106-inch- diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches.
   d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

5. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series TSA.
      2) GEMCO; Press and Peel.
      3) Midwest Fasteners, Inc.; Self Stick.
   b. Baseplate: Galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
   c. Spindle: Copper- or zinc-coated, low carbon steel , fully annealed, 0.106-inch- diameter shank, length to suit depth of insulation indicated.
   d. Adhesive-backed base with a peel-off protective cover.

6. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      1) AGM Industries, Inc.; RC-150.
      2) GEMCO; R-150.
      3) Midwest Fasteners, Inc.; WA-150.
      4) Nelson Stud Welding; Speed Clips.

b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

7. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.
   a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      1) GEMCO.
      2) Midwest Fasteners, Inc.

C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

2.11 HEAT TRACE SYSTEM

A. Heat Tape

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Chromalox: SRL 3 .
   b. Hevi-Duty/Nelson.: Limitrace
   c. Raychem Corp. Chemelex: 3 -BTV

2. Self-regulating type heat trace with copper bus wire, semi-conductive core and flame retardant insulating jacket. Rated for 3 watts per foot of pipe
3. Provide power connection kit and end seal connection kit and slice/tee kit as required.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

1. Verify that systems and equipment to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.

3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
   a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.
7. Unions
8. Flanges
9. Strainers
10. Valves

Q. Exposed Ductwork: Locate insulation and cover seams in least visible locations.

R. In systems with rigid insulation, slip joints shall be installed every 25-30 feet for thermal expansion. They shall overlap and be caulked according to the jacket manufacturer's installation recommendation. On cold piping, flexible fiberglass insulation shall separate the rigid insulation pieces at the slip joint.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.

3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.

1. Comply with requirements in Division 07 Section "Penetration Firestopping"irestopping and fire-resistive joint sealers.

F. Insulation Installation at Floor Penetrations:

1. Duct: Install insulation continuously through floor penetrations that are not fire rated. For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Pipe: Install insulation continuously through floor penetrations.
3. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

3.5 EQUIPMENT, TANK, AND VESSEL INSULATION INSTALLATION

A. Mineral Fiber, Pipe and Tank Insulation Installation for Tanks and Vessels: Secure insulation with adhesive and anchor pins and speed washers.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of tank and vessel surfaces.
2. Groove and score insulation materials to fit as closely as possible to equipment, including contours. Bevel insulation edges for cylindrical surfaces for tight joints. Stagger end joints.

3. Protect exposed corners with secured corner angles.
4. Install adhesively attached or self-sticking insulation hangers and speed washers on sides of tanks and vessels as follows:
   a. Do not weld anchor pins to ASME-labeled pressure vessels.
   b. Select insulation hangers and adhesive that are compatible with service temperature and with substrate.
   c. On tanks and vessels, maximum anchor-pin spacing is 3 inches from insulation end joints, and 16 inches o.c. in both directions.
   d. Do not overcompress insulation during installation.
   e. Cut and miter insulation segments to fit curved sides and domed heads of tanks and vessels.
   f. Impale insulation over anchor pins and attach speed washers.
   g. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
5. Secure each layer of insulation with stainless-steel or aluminum bands. Select band material compatible with insulation materials.
6. Where insulation hangers on equipment and vessels are not permitted or practical and where insulation support rings are not provided, install a girdle network for securing insulation. Stretch prestressed aircraft cable around the diameter of vessel and make taut with clamps, turnbuckles, or breather springs. Place one circumferential girdle around equipment approximately 6 inches from each end. Install wire or cable between two circumferential girdles 12 inches o.c. Install a wire ring around each end and around outer periphery of center openings, and stretch prestressed aircraft cable radially from the wire ring to nearest circumferential girdle. Install additional circumferential girdles along the body of equipment or tank at a minimum spacing of 48 inches o.c. Use this network for securing insulation with tie wire or bands.
7. Stagger joints between insulation layers at least 3 inches.
8. Install insulation in removable segments on equipment access doors, manholes, handholes, and other elements that require frequent removal for service and inspection.
9. Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
10. For equipment with surface temperatures below ambient, apply mastic to open ends, joints, seams, breaks, and punctures in insulation.

3.6 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.

4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

E. When insulating control valves, strainers, and any other devices requiring frequent access, the insulation shall be fit in such a way that there is an access section which can be readily removed and replaced without damaging adjacent insulation. If a different insulating material is used for boxing in control valve assemblies, etc., the thickness of the insulation shall be adjusted to provide the specified thermal resistance.

3.7 FLEXIBLE ELASTOMERIC INSULATION INSTALLATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 MINERAL-FIBER INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

E. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
d. Do not overcompress insulation during installation.
e. Impale insulation over pins and attach speed washers.
f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
   a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
   b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

F. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
   a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
   b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.

c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
d. Do not overcompress insulation during installation.
e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
   a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
   b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.9 POLYISOCYANURATE INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with tape or bands and tighten without deforming insulation materials. Orient longitudinal joints between half sections in 3 and 9 o'clock positions on the pipe.
2. For insulation with factory-applied jackets with vapor barriers, do not staple longitudinal tabs but secure tabs with additional adhesive or tape as recommended by insulation material manufacturer and seal with vapor-barrier mastic.
3. All insulation shall be tightly butted and free of voids and gaps at all joints. Vapor barrier must be continuous. Before installing jacket material, install vapor-barrier system.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, same thickness of adjacent pipe insulation, not to exceed 1-1/2-inch thickness.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polyisocyanurate block insulation of same thickness as pipe insulation.

C. Insulation Installation on Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of polyisocyanurate insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.10 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

B. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

C. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

D. Where PVDC jackets are indicated, install as follows:

1. Apply three separate wraps of filament tape per insulation section to secure pipe insulation to pipe prior to installation of PVDC jacket.
2. Wrap factory-presized jackets around individual pipe insulation sections with one end overlapping the previously installed sheet. Install presized jacket with an approximate overlap at butt joint of 2 inches over the previous section. Adhere lap seal using adhesive or SSL, and then apply 1-1/4 circumferences of appropriate PVDC tape around overlapped butt joint.
3. Continuous jacket can be spiral wrapped around a length of pipe insulation. Apply adhesive or PVDC tape at overlapped spiral edge. When electing to use adhesives, refer to manufacturer's written instructions for application of adhesives along this spiral edge to maintain a permanent bond.

4. Jacket can be wrapped in cigarette fashion along length of roll for insulation systems with an outer circumference of 33-1/2 inches or less. The 33-1/2-inch- circumference limit allows for 2-inch- overlap seal. Using the length of roll allows for longer sections of jacket to be installed at one time. Use adhesive on the lap seal. Visually inspect lap seal for "fishmouthing," and use PVDC tape along lap seal to secure joint.
5. Repair holes or tears in PVDC jacket by placing PVDC tape over the hole or tear and wrapping a minimum of 1-1/4 circumferences to avoid damage to tape edges.

3.11 FINISHES

A. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

C. Do not field paint aluminum or stainless-steel jackets.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.
2. Inspect field-insulated equipment, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location(s) for each type of equipment defined in the "Equipment Insulation Schedule" Article. For large equipment, remove only a portion adequate to determine compliance.
3. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.13 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation: See drawing schedule

B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.14 EQUIPMENT INSULATION SCHEDULE

A. See drawing schedule(s) for equipment requiring insulation

3.15 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

C. See drawings schedule for pipes requiring insulation

3.16 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. See drawing schedule for items requiring indoor field-applied jacketing

3.17 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. See drawing schedule for items requiring indoor field-applied jacketing

3.18 FIELD QUALITY CONTROL

A. Any discovered deviation from the specified materials and methods shall be considered cause for spot-check dismantling of Work to be performed during the preceding day's work. If further deviations are so discovered, the day's Work proceeding that day may be requested to be checked. All dismantling and reinstallation shall be performed at no additional cost to the Contract.

B. Prior to initiation of work, samples of insulation materials shall be submitted for approval, and a sample of the installation of a section of pipe and fitting demonstrating installation techniques and workmanship shall be witnessed and approved.

END OF SECTION 230700

SECTION 230800 - COMMISSIONING OF HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes commissioning process requirements for HVAC&R systems, assemblies, and equipment.

B. Related Sections:

1. Division 01 Section "General Commissioning Requirements" for general commissioning process requirements.

1.3 DEFINITIONS

A. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.

B. CxA: Commissioning Authority.

C. HVAC&R: Heating, Ventilating, Air Conditioning, and Refrigeration.

D. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.4 ALLOWANCES

A. Labor, instrumentation, tools, and equipment costs for technicians for the performance of commissioning testing are covered by the "Schedule of Allowances" Article in Division 01 Section "Allowances."

1.5 UNIT PRICES

A. Commissioning testing allowance may be adjusted up or down by the "List of Unit Prices" Article in Division 01 Section "Unit Prices" when actual man-hours are computed at the end of commissioning testing.

1.6 CONTRACTOR'S RESPONSIBILITIES

A. Perform commissioning tests at the direction of the CxA.

B. Attend construction phase controls coordination meeting.

C. Attend testing, adjusting, and balancing review and coordination meeting.

D. Participate in HVAC&R systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.

E. Provide information requested by the CxA for final commissioning documentation.

F. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.

1.7 CxA'S RESPONSIBILITIES

A. Provide Project-specific construction checklists and commissioning process test procedures for actual HVAC&R systems, assemblies, equipment, and components to be furnished and installed as part of the construction contract.

B. Direct commissioning testing.

C. Verify testing, adjusting, and balancing of Work are complete.

D. Provide test data, inspection reports, and certificates in Systems Manual.

1.8 COMMISSIONING DOCUMENTATION

A. Provide the following information to the CxA for inclusion in the commissioning plan:

1. Plan for delivery and review of submittals, systems manuals, and other documents and reports.
2. Identification of installed systems, assemblies, equipment, and components including design changes that occurred during the construction phase.
3. Process and schedule for completing construction checklists and manufacturer's prestart and startup checklists for HVAC&R systems, assemblies, equipment, and components to be verified and tested.
4. Certificate of completion certifying that installation, prestart checks, and startup procedures have been completed.
5. Certificate of readiness certifying that HVAC&R systems, subsystems, equipment, and associated controls are ready for testing.
6. Test and inspection reports and certificates.
7. Corrective action documents.
8. Verification of testing, adjusting, and balancing reports.

1.9 INFORMATIONAL SUBMITTALS

A. Certificates of readiness.

B. Certificates of completion of installation, prestart, and startup activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTING PREPARATION

A. Certify that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

B. Certify that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

C. Certify that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.

D. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

E. Inspect and verify the position of each device and interlock identified on checklists.

F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.2 Testing AND BALANCING VERIFICATION

A. Prior to performance of testing and balancing Work, provide copies of reports, sample forms, checklists, and certificates to the CxA.

B. Notify the CxA at least 10 days in advance of testing and balancing Work, and provide access for the CxA to witness testing and balancing Work.

C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.

1. The CxA will notify testing and balancing Contractor 10 days in advance of the date of field verification. Notice will not include data points to be verified.

2. The testing and balancing Contractor shall use the same instruments (by model and serial number) that were used when original data were collected.
3. Failure of an item includes, other than sound, a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report. For sound pressure readings, a deviation of 3 dB shall result in rejection of final testing. Variations in background noise must be considered.
4. Remedy the deficiency and notify the CxA so verification of failed portions can be performed.

3.3 GENERAL TESTING REQUIREMENTS

A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.

B. Scope of HVAC&R testing shall include entire HVAC&R installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.

C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

D. The CxA along with the HVAC&R Contractor , testing and balancing Contractor , and HVAC&R Instrumentation and Control Contractor shall prepare detailed testing plans, procedures, and checklists for HVAC&R systems, subsystems, and equipment.

E. Tests will be performed using design conditions whenever possible.

F. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

G. The CxA may direct that set points be altered when simulating conditions is not practical.

H. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.

I. If tests cannot be completed because of a deficiency outside the scope of the HVAC&R system, document the deficiency and report it to the Owner. After deficiencies are resolved, reschedule tests.

J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.4 HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

A. Boiler Testing and Acceptance Procedures: Testing requirements are specified in Division 23 boiler Sections. Provide submittals, test data, inspector record, and boiler certification to the CxA.

B. HVAC&R Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls." Assist the CxA with preparation of testing plans.

C. Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment requirements are specified in Division 23 piping Sections. HVAC&R Contractor shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating plan and final reports to the CxA. Plan shall include the following:

1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector, showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
2. Description of equipment for flushing operations.
3. Minimum flushing water velocity.
4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.

D. Refrigeration System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of chillers, cooling towers, refrigerant compressors and condensers, heat pumps, and other refrigeration systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.

E. HVAC&R Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air, steam, and hydronic distribution systems; special exhaust; and other distribution systems, including HVAC&R terminal equipment and unitary equipment.

F. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.

END OF SECTION 230800

SECTION 230993 - SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

B. Related Sections include the following:

1. Section 230900 "Instrumentation and Control for HVAC" for control equipment and devices and for submittal requirements.

1.2 DEFINITIONS

A. DDC: Direct digital control.

B. VAV: Variable air volume.

C. Inches w.g.: Inches of water gauge, or inches of water column.

1.3 GENERAL

A. A value in this specification followed by the word “adjustable” or the abbreviation “adj.” means the value can be changed manually through the DDC system by the Owner.

B. All duct mounted smoke detectors shall be provided and installed by this contractor. This includes ALL power, temperature control, and alarm wiring.

C. All control points shall be exposed as BACnet objects and shall be viewable and editable over the internet from a remote location with a standard web browser.

D. When filter pressure monitoring and control is required for a unit, filter monitoring and control shall apply to all filter banks in the unit.

1.4 AIR HANDLING UNIT

A. Basic Unit Controls:

1. Control-voltage transformer.
2. Wall-mounted thermostat or sensor with the following features:
   a. Automatic changeover.
   b. Temperature set point.

3. Remote Wall -Mounted Annunciator Panel for Each Unit:

a. Lights to indicate power on, cooling, heating, fan running, filter dirty, and unit alarm or failure.
b. DDC controller or programmable timer.
c. Digital display of outdoor-air temperature, supply-air temperature, return-air temperature, economizer damper position, indoor-air quality, and control parameters.

B. Electronic Controller:

1. Controller shall have volatile-memory backup.
2. Safety Control Operation:
   a. Smoke Detectors: Stop fan and close outdoor-air damper if smoke is detected. Provide additional contacts for alarm interface to fire alarm control panel.
   b. Fire Alarm Control Panel Interface: Provide control interface to coordinate with operating sequence described in Section 284621.11 "Addressable Fire-Alarm Systems."
   c. Low-Discharge Temperature: Stop fan and close outdoor-air damper if supply air temperature is less than 40 deg F .
   d. Defrost Control for Condenser Coil: Pressure differential switch to initiate defrost sequence.

3. Scheduled Operation: Occupied and unoccupied periods on 365-day clock with a minimum of four programmable periods per day.
4. Unoccupied Period:
   a. Heating Setback: Plus 10 deg F .
   b. Cooling Setback: System off.
   c. Override Operation: Two hours.

5. Supply Fan Operation:
   a. Occupied Periods: Run fan continuously.
   b. Unoccupied Periods: Cycle fan to maintain setback temperature.

6. Refrigerant Circuit Operation:
   a. Occupied Periods: Cycle or stage compressors to match compressor output to cooling load to maintain room temperature and humidity. Cycle condenser fans to maintain maximum hot-gas pressure. Operate low-ambient control kit to maintain minimum hot-gas pressure.
   b. Unoccupied Periods: Cycle compressors and condenser fans for heating to maintain setback temperature.
   c. Switch reversing valve for heating or cooling mode on air-to-air heat pump.

7. Fixed Minimum Outdoor-Air Damper Operation:
   a. Occupied Periods: Refer to schedule.
   b. Unoccupied Periods: Close the outdoor-air damper.

8. Economizer Outdoor-Air Damper Operation:
   a. Morning warm up cool down building outdoor air flush cycles.
   b. Occupied Periods: Open to percent fixed minimum intake, and maximum 100 percent of the fan capacity. Controller shall permit air-side economizer operation when outdoor air is less than 60 deg F . Use mixed-air and outdoor-air temperature

to adjust mixing dampers. Start relief-air fan with end switch on outdoor-air damper. During economizer cycle operation, lock out cooling.

c. Unoccupied Periods: Close outdoor-air damper and open return-air damper.

d. Outdoor-Airflow Monitor: Accuracy maximum plus or minus 5 percent within 15 and 100 percent of total outdoor air. Monitor microprocessor shall adjust for temperature, and output shall range from 2- to 10-V dc .

1.5 Variable Frequency Drive (VFD) Interface

A. Current VFD status and operating conditions shall be monitored through its communications interface port. The interface shall monitor and trend the points as shown on the points list.

END OF SECTION 230993

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

B. Delegated Process Duct Design: Duct construction for process room ducts, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with the process duct schedule on the drawings, SMACNA's latest version of "Round Industrial Duct Construction Standards", and SMACNA's latest version of "Rectangular Industrial Duct Construction Standards ".

C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

D. Indicated duct sizes are inside clear dimensions.

1.2 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.4.4 - "HVAC System Construction and Insulation."

D. Construct all ductwork to be free from vibration, chatter, objectionable pulsations and leakage under specified operating conditions. Objectionable conditions shall be corrected to the satisfaction of the Owner , at no cost to the Contract.

1.3 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1.4 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Lindab Inc.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1.5 SHEET METAL MATERIALS

A. See drawing schedule for sheet metal material requirements

B. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

C. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60 (Z180) .
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

D. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

E. Tie Rods: Galvanized steel, 1/4-inch (6-mm) minimum diameter for lengths 36 inches (900 mm) or less; 3/8-inch (10-mm) minimum diameter for lengths longer than 36 inches (900 mm).

1.6 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width: 3 inches (76 mm) .
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg (2500 Pa), positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F (Minus 40 to plus 93 deg C).
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. DESIGNER NOTE: SELECT WATER BASED DUCT SEALANT WHENEVER POSSIBLE. SOLVENT BASED SEALANT IS USED FOR LOW TEMPERATURE APPLICATIONS BELOW 32°F.

D. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg (2500 Pa), positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
9. VOC: Maximum 395 g/L.
10. Maximum Static-Pressure Class: 10-inch wg (2500 Pa), positive or negative.
11. Service: Indoor or outdoor.
12. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

F. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

H. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg (0.14 L/s per sq. m at 250 Pa) and shall be rated for 10-inch wg (2500-Pa) static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

1.7 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1 (Table 4-1M), "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

E. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

F. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

G. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

1.8 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch (25 mm), plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches (38 mm).

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 23 Section "Air Duct Accessories" for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

M. Ductwork sleeves shall be formed with galvanized steel.

N. Screws or duct penetrations shall not be permitted for FRP, PVC, Phenolic, or other ducts conveying dust, chemical, or fume exhausts.

O. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

P. At ends of ducts not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering until time connections to be completed.

Q.

R. Drain Pockets:

1. Provide form drain pocket in outdoor air, dishwasher exhaust, any duct carrying high-moisture air, and humidifier sections with deep seal traps.
2. Connect to drainage system.

S. Provide expanded take-offs for branch duct connections or 45 degree entry fittings. Square edge 90 degree take-off fittings or straight taps will not be accepted

T. Size Change:

1. Increase and decrease duct sizes gradually, not exceeding 20 degrees divergence and 30 degrees convergence from connecting upstream duct surface, unless otherwise noted on drawings.
2. Maximum divergence upstream of equipment to be 20 degrees and maximum convergence downstream to be 30 degrees.

U. Where ducts pass through interior partitions and exterior walls and are exposed to view, conceal spaces between construction openings and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts. Overlap openings on 4 sides by at least 1-1/2 inches.

1.9 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

D. Repair or replace damaged sections and finished work that does not comply with these requirements.

1.10 DUCT SEALING

A. See drawing schedule for duct sealing requirements

B. Install duct to pitch toward outside air intakes and drain to outside of building. Solder or seal seams to form watertight joints.

C. [Fabricate seams and joints liquid-tight with continuous exterior welds or gasketed, bolted flanged connections in following locations:

1. Kitchen or other high-grease content.
2. Dishwasher or other high-moisture content.
3. Shower rooms.
4. Lower 6 inches of horizontal outdoor air ducts.]

1.11 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches (100 mm) thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches (100 mm) thick.
5. Do not use powder-actuated concrete fasteners for seismic restraints.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1 (Table 4-1M), "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches (610 mm) of each elbow and within 48 inches (1200 mm) of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet (5 m).

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1.12 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

1.13 PAINTING

A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Division 09 painting Sections.

1.14 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.

C. Duct system will be considered defective if it does not pass tests and inspections.

1.15 DUCT CLEANING

A. Clean new duct system(s) before testing, adjusting, and balancing.

B. Use service openings for entry and inspection.

1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Division 23 Section "Air Duct Accessories" for access panels and doors.
2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
3. Remove and reinstall ceiling to gain access during the cleaning process.

C. Particulate Collection and Odor Control:

1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.
2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.

D. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers).
2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.

4. Coils and related components.
5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
6. Supply-air ducts, dampers, actuators, and turning vanes.
7. Dedicated exhaust and ventilation components and makeup air systems.

E. Mechanical Cleaning Methodology:

1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
5. Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
6. Provide drainage and cleanup for wash-down procedures.
7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.

1.16 START UP

A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing for HVAC."

1.17 DUCT SCHEDULE

A. See drawing schedule for duct pressure, seal and leakage class, and elbow configuration.

B. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel .

END OF SECTION 233113

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.

a. Product data to include but not be limited to:

1) Dimensional and weight data
2) Temperature/Pressure ratings
3) Manufacturer’s name and model number
4) Materials of construction
5) Sealant and gasket materials
6) Manufacturer’s installation instructions.
7) Capacities and performance

1.2 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

1.3 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with AMCA 500-D testing for damper rating.

1.4 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fusible Links: Furnish quantity equal to 10 percent of amount installed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60.
2. Exposed-Surface Finish: Mill phosphatized.

C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and No.4 finish for exposed ducts.

D. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

E. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.

F. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Air Balance Inc.; a division of Mestek, Inc.
   b. American Warming and Ventilating; a division of Mestek, Inc.
   c. Flexmaster U.S.A., Inc.
   d. McGill AirFlow LLC.
   e. METALAIRE, Inc.
   f. Nailor Industries Inc.
   g. Pottorff; a division of PCI Industries, Inc.
   h. Ruskin Company.

2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames:
   a. Hat-shaped, galvanized-steel channels, 0.064-inch minimum thickness.
   b. Mitered and welded corners.

c. Flanges for attaching to walls and flangeless frames for installing in ducts.

5. Blades:
   a. Multiple or single blade.
   b. Parallel- or opposed-blade design.
   c. Stiffen damper blades for stability.
   d. Galvanized-steel, 0.064 inch thick.

6. Blade Axles: Galvanized steel.
7. Bearings:
   a. Molded synthetic.
   b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.

8. Tie Bars and Brackets: Galvanized steel.

B. Damper Hardware:

1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
2. Include center hole to suit damper operating-rod size.
3. Include elevated platform for insulated duct mounting.

2.3 CONTROL DAMPERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. American Warming and Ventilating; a division of Mestek, Inc.
2. Arrow United Industries; a division of Mestek, Inc.
3. Cesco Products; a division of Mestek, Inc.
4. Flexmaster U.S.A., Inc.
5. Greenheck Fan Corporation.
6. McGill AirFlow LLC.
7. METALAIRE, Inc.
8. Nailor Industries Inc.
9. Ruskin Company.

B. Low-leakage rating, with linkage outside airstream, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.

C. Frames:

1. Hat shaped.
2. Galvanized-steel channels, 0.064 inch thick.
3. Mitered and welded corners.

D. Blades:

1. Multiple blade with maximum blade width of 8 inches.

2. Opposed-blade design.
3. Galvanized steel.
4. 0.064 inch thick.
5. Blade Edging: Closed-cell neoprene edging.
6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.

E. Blade Axles: 1/2-inch- diameter; galvanized steel; blade-linkage hardware of zinc-plated steel and brass; ends sealed against blade bearings.

1. Operating Temperature Range: From minus 40 to plus 200 deg F.

F. Bearings:

1. Stainless-steel sleeve.
2. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
3. Thrust bearings at each end of every blade.

2.4 FIRE DAMPERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Arrow United Industries; a division of Mestek, Inc.
2. Cesco Products; a division of Mestek, Inc.
3. Greenheck Fan Corporation.
4. McGill AirFlow LLC.
5. METALAIRE, Inc.
6. Nailor Industries Inc.
7. Pottorff; a division of PCI Industries, Inc.
8. Ruskin Company.

B. Type: Static and dynamic; rated and labeled according to UL 555 by an NRTL.

C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 4000-fpm velocity.

D. Fire Rating: 1-1/2 hours.

E. Frame: Curtain type with blades outside airstream except when located behind grille where blades may be inside airstream; fabricated with roll-formed, 0.034-inch- thick galvanized steel; with mitered and interlocking corners.

F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.

1. Minimum Thickness: 0.052 or 0.138 inch thick, as indicated, and of length to suit application.
2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.

G. Mounting Orientation: Vertical or horizontal as indicated.

H. Blades: Roll-formed, interlocking, 0.034-inch- thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch- thick, galvanized-steel blade connectors.

I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.

J. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

2.5 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ductmate Industries, Inc.
2. METALAIRE, Inc.
3. SEMCO Incorporated.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

C. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-3, "Vanes and Vane Runners," and 2-4, "Vane Support in Elbows."

D. Vane Construction: Single wall for ducts up to 48 inches wide and double wall for larger dimensions.

2.6 DUCT-MOUNTED ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. American Warming and Ventilating; a division of Mestek, Inc.
2. Cesco Products; a division of Mestek, Inc.
3. Ductmate Industries, Inc.
4. Flexmaster U.S.A., Inc.
5. Greenheck Fan Corporation.
6. McGill AirFlow LLC.
7. Nailor Industries Inc.
8. Pottorff; a division of PCI Industries, Inc.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-10, "Duct Access Doors and Panels," and 2-11, "Access Panels - Round Duct."

1. Door:
   a. Double wall, rectangular.
   b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
   c. Hinges and Latches: 1-by-1-inch butt or piano hinge and cam latches.

d. Fabricate doors airtight and suitable for duct pressure class.

2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
3. Number of Hinges and Locks:
   a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.
   b. Access Doors up to 18 Inches Square: Two hinges and two sash locks.
   c. Access Doors up to 24 by 48 Inches: Three hinges and two compression latches.
   d. Access Doors Larger Than 24 by 48 Inches: Four hinges and two compression latches with outside and inside handles.

2.7 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ductmate Industries, Inc.
2. Ventfabrics, Inc.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches wide attached to 2 strips of 2-3/4-inch- wide, 0.028-inch- thick, galvanized sheet steel or 0.032-inch- thick aluminum sheets. Provide metal compatible with connected ducts.

E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.

1. Minimum Weight: 26 oz./sq. yd..
2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
3. Service Temperature: Minus 40 to plus 200 deg F.

F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.

1. Minimum Weight: 24 oz./sq. yd..
2. Minimum Tensile Strength: 500 lbf/inch in the warp and 440 lbf/inch in the filling.
3. Service Temperature: Minus 50 to plus 250 deg F.

2.8 FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.

B. Insulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene vapor-barrier film.

1. Pressure Rating: 4-inch wg positive and 0.5-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 20 to plus 175 deg F.
4. Insulation R-Value: Comply with ASHRAE/IESNA 90.1-2004.

C. Flexible Duct Connectors:

1. Clamps: Nylon strap in sizes 3 through 18 inches, to suit duct size.
2. Non-Clamp Connectors: Liquid adhesive plus tape.

D. Flexible Ductwork Elbow Supports:

1. Available Manufacturers:
   a. Thermaflex:Flexflow Elbow

2. In lieu of using die stamped elbows for flexible duct connections to supply air diffusers (as detailed on the drawings), the Contractor may delete the die stamped elbow and directly connect the flexible duct to the diffusers with the use of a flexible ductwork elbow support.
3. Elbow supports shall be constructed of durable composite material and shall be fully adjustable to support flexible ductwork diameter from 6” to 16” in diameter.
4. Elbow supports shall be in UL listed for use in return air plenums.

2.9 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.

D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.

1. Install steel volume dampers in steel ducts.
2. Install aluminum volume dampers in aluminum ducts.

E. Set dampers to fully open position before testing, adjusting, and balancing.

F. Install test holes at fan inlets and outlets and elsewhere as indicated.

G. Install fire dampers according to UL listing.

H. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:

1. On both sides of duct coils.
2. At outdoor-air intakes and mixed-air plenums.
3. At drain pans and seals.
4. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
5. Control devices requiring inspection.
6. Elsewhere as indicated.

I. Install access doors with swing against duct static pressure.

J. Access door size shall be 12 inches by 12 inches unless specified otherwise.

K. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

L. Install flexible connectors to connect ducts to equipment.

M. For fans developing static pressures of 5-inch wg and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.

N. Connect diffusers or light troffer boots to ducts directly or with maximum 60-inch lengths of flexible duct clamped or strapped in place.

O. Install duct test holes where required for testing and balancing purposes.

P. Access doors constructed with sheet metal screw fasteners will not be accepted.

Q. Flexible Ductwork:

1. Do not exceed 5 feet in length. Flexible ducts shall be used only to compensate for branch duct and diffuser/grille misalignment. No kinks or bends shall be allowed.
2. Install flexible ductwork with minimum offsets, sag, and trim.
3. Connect with adjustable band and clamp to secure duct to trunk fitting and to distribution unit fitting. Banding shall be nylon straps, fastened under insulation and over the inner

lines with a second band securing the insulation and jacket. Sheet metal screws will not be accepted.

4. Seal ends of flex duct with foil duct tape over insulation and jacket.
5. Individual sections of flexible ductwork shall be of one piece construction. Splicing of short sections will not be accepted.
6. Penetration of any partition, wall, or floor with flexible duct will not be accepted.
7. Minimum length of duct trunk fitting for flex duct connection shall be 4 inches.

R. Fire dampers and fire/smoke dampers shall be installed where and when necessary, whether or not indicated on drawings, in compliance with all applicable local, state and insurance codes and requirements, and other authorities having jurisdiction.

S. Manually test each fire damper for proper operation by removing the fusible link. Repair or replace any fire damper that does not close completely. Re-install fusible link after test.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
4. Inspect turning vanes for proper and secure installation.
5. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION 233300

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 ACTION SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

PART 2 - PRODUCTS

2.1 REGISTERS AND GRILLES

A. Adjustable Bar Register:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. A-J Manufacturing Co., Inc.
   b. Carnes.
   c. Hart & Cooley Inc.
   d. Krueger.
   e. METALAIRE, Inc.
   f. Nailor Industries Inc.
   g. Price Industries.
   h. Titus.
   i. Tuttle & Bailey.

2. Material: See Air Outlets and Inlets Schedule on drawings.
3. Finish: See Air Outlets and Inlets Schedule on drawings.
4. Frame: See Air Outlets and Inlets Schedule on drawings.
5. Mounting: See Air Outlets and Inlets Schedule on drawings.
6. Damper Type: See Air Outlets and Inlets Schedule on drawings.

B. Adjustable Bar Grille:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. A-J Manufacturing Co., Inc.
   b. Carnes.
   c. Hart & Cooley Inc.
   d. Krueger.

e. METALAIRE, Inc.
f. Nailor Industries Inc.
g. Price Industries.
h. Titus.
i. Tuttle & Bailey.

2. Material: See Air Outlets and Inlets Schedule on drawings.
3. Finish: See Air Outlets and Inlets Schedule on drawings.
4. Frame: See Air Outlets and Inlets Schedule on drawings .
5. Mounting: See Air Outlets and Inlets Schedule on drawings.

C. Fixed Face Register:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. A-J Manufacturing Co., Inc.
   b. Carnes.
   c. Hart & Cooley Inc.
   d. Krueger.
   e. Nailor Industries Inc.
   f. Price Industries.
   g. Titus.
   h. Tuttle & Bailey.

2. Material: See Air Outlets and Inlets Schedule on drawings.
3. Finish: See Air Outlets and Inlets Schedule on drawings.
4. Face Arrangement: Perforated core.
5. Frame: See Air Outlets and Inlets Schedule on drawings.
6. Mounting: See Air Outlets and Inlets Schedule on drawings.
7. Damper Type: See Air Outlets and Inlets Schedule on drawings.

D. Fixed Face Grille:

1. Manufacturers: Subject to compliance with requirements, :
   a. A-J Manufacturing Co., Inc.
   b. Carnes.
   c. Hart & Cooley Inc.
   d. Krueger.
   e. Nailor Industries Inc.
   f. Price Industries.
   g. Titus.
   h. Tuttle & Bailey.

2. Material: See Air Outlets and Inlets Schedule on drawings .
3. Finish: See Air Outlets and Inlets Schedule on drawings .
4. Face Arrangement: Perforated core.
5. Core Construction: Integral .
6. Frame: See Air Outlets and Inlets Schedule on drawings wide.
7. Mounting Frame: Filter .
8. Mounting: See Air Outlets and Inlets Schedule on drawings .

2.2 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 233713

SECTION 237413 - PACKAGED, OUTDOOR, CENTRAL-STATION AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 DEFINITIONS

A. DDC: Direct-digital controls.

B. ECM: Electrically commutated motor.

C. RTU: Rooftop unit. As used in this Section, this abbreviation means packaged, outdoor, central-station air-handling units. This abbreviation is used regardless of whether the unit is mounted on the roof or on a concrete base on ground.

D. Supply-Air Fan: The fan providing supply air to conditioned space. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.

E. Supply-Air Refrigerant Coil: Refrigerant coil in the supply-air stream to absorb heat (provide cooling) during cooling operations and to reject heat (provide heating) during heating operations. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.

1.2 PERFORMANCE REQUIREMENTS

A. Each fan and motor combination to be capable of delivering plus or minus 10% of air quantity scheduled at the scheduled static pressure while maintaining stable fan performance.

B. Unit static pressure shall take into consideration actual static pressure loss of components furnished with unit.

1.3 ACTION SUBMITTALS

A. Product Data: Include manufacturer's technical data for each RTU, including rated capacities, dimensions, required clearances, characteristics, furnished specialties, and accessories.

1. Materials of construction
2. Fan curves to include a series of curves indicating relationship of CFM and static pressure for various and brake horsepower curves. Indicate design operating point clearly on fan curves.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control test reports.

1.5 CLOSE OUT SUBMITTALS

A. Operation and Maintenance Data: For RTUs to include in emergency, operation, and maintenance manuals.

B. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. ARI Compliance:

1. Comply with ARI 210/240 and ARI 340/360 for testing and rating energy efficiencies for RTUs.
2. Comply with ARI 270 for testing and rating sound performance for RTUs.

B. ASHRAE Compliance:

1. Comply with ASHRAE 15 for refrigeration system safety.
2. Comply with ASHRAE 33 for methods of testing cooling and heating coils.
3. Comply with applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

D. NFPA Compliance: Comply with NFPA 90A and NFPA 90B.

E. UL Compliance: Comply with UL 1995.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace components of RTUs that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Compressors: Manufacturer's standard, but not less than five years from date of Substantial Completion.
2. Warranty Period for Gas Furnace Heat Exchangers: Manufacturer's standard, but not less than 10 years from date of Substantial Completion.
3. Warranty Period for Solid-State Ignition Modules: Manufacturer's standard, but not less than three years from date of Substantial Completion.

4. Warranty Period for Control Boards: Manufacturer's standard, but not less than three years from date of Substantial Completion.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fan Belts: One set for each belt-driven fan.
2. Filters: One set of filters for each unit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AAON, Inc.
2. Carrier Corporation.
3. Lennox Industries Inc.
4. McQuay International.
5. Trane; American Standard Companies, Inc.
6. YORK International Corporation.

2.2 CASING

A. General Fabrication Requirements for Casings: Formed and reinforced double-wall insulated panels, fabricated to allow removal for access to internal parts and components, with joints between sections sealed.

B. Exterior Casing Material: Galvanized steel with factory-painted finish, with pitched roof panels and knockouts with grommet seals for electrical and piping connections and lifting lugs.

1. Exterior Casing Thickness: 0.052 inch thick.

C. Inner Casing Fabrication Requirements:

1. Inside Casing: Galvanized steel, 0.028 inch thick.

D. Casing Insulation and Adhesive: Comply with NFPA 90A or NFPA 90B.

1. Materials: ASTM C 1071, Type I.
2. Thickness: 1 inch.
3. Liner materials shall have air-stream surface coated with an erosion- and temperature-resistant coating or faced with a plain or coated fibrous mat or fabric.
4. Liner Adhesive: Comply with ASTM C 916, Type I.

E. Condensate Drain Pans: Formed sections of stainless-steel sheet, a minimum of 2 inches deep, and complying with ASHRAE 62.1-2004.

1. Double-Wall Construction: Fill space between walls with foam insulation and seal moisture tight.
2. Drain Connections: Threaded nipple.
3. Pan-Top Surface Coating: Corrosion-resistant compound.

F. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

2.3 FANS

A. Direct-Driven Supply-Air Fans: Double width, forward curved or backward inclined, centrifugal; with permanently lubricated motor resiliently mounted in the fan inlet. Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.

B. Belt-Driven Supply-Air Fans: Double width, forward curved, centrifugal; with permanently lubricated, single-speed motor installed on an adjustable fan base resiliently mounted in the casing. Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.

C. Condenser-Coil Fan: Propeller, mounted on shaft of permanently lubricated motor.

D. Relief-Air Fan: Forward curved, shaft mounted on permanently lubricated motor.

E. Fan Motor: Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

1. Fan motors shall not operate into motor service factor in any case. Drive efficiency shall be considered in motor selection according to manufacturer’s published recommendation, or according to AMCA Publication 203, Appendix L.

2.4 COILS

A. Supply-Air Refrigerant Coil:

1. Aluminum-plate fin and seamless copper tube in steel casing with equalizing-type vertical distributor.
2. Polymer strip shall prevent all copper coil from contacting steel coil frame or condensate pan.
3. Coil Split: Interlaced.
4. Condensate Drain Pan: Stainless steel formed with pitch and drain connections complying with ASHRAE 62.1-2004.

2.5 REFRIGERANT CIRCUIT COMPONENTS

A. Number of Refrigerant Circuits: One .

B. Compressor: Hermetic, scroll, mounted on vibration isolators; with internal overcurrent and high-temperature protection, internal pressure relief, and crankcase heater.

C. Refrigeration Specialties:

1. Refrigerant: R-410A .
2. Refrigerant: R-407C or R-410A.
3. Expansion valve with replaceable thermostatic element.
4. Refrigerant filter/dryer.
5. Manual-reset high-pressure safety switch.
6. Automatic-reset low-pressure safety switch.
7. Minimum off-time relay.
8. Automatic-reset compressor motor thermal overload.
9. Brass service valves installed in compressor suction and liquid lines.
10. Low-ambient kit high-pressure sensor.

2.6 AIR FILTRATION

A. Minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.

1. Glass Fiber: Minimum 80 percent arrestance, and MERV 13 .
2. Pleated: Minimum 90 percent arrestance, and MERV 13 .

2.7 DAMPERS

A. Outdoor-Air Damper: Linked damper blades, for 0 to 25 percent outdoor air, with motorized damper filter.

B. Outdoor- and Return-Air Mixing Dampers: Parallel- or opposed-blade galvanized-steel dampers mechanically fastened to cadmium plated for galvanized-steel operating rod in reinforced cabinet. Connect operating rods with common linkage and interconnect linkages so dampers operate simultaneously.

1. Damper Motor: Modulating with adjustable minimum position.
2. Relief-Air Damper: Gravity actuated or motorized, as required by ASHRAE/IESNA 90.1-2004, with bird screen and hood.

2.8 ELECTRICAL POWER CONNECTION

A. Provide for single connection of power to unit with unit-mounted disconnect switch accessible from outside unit and control-circuit transformer with built-in overcurrent protection.

2.9 CONTROLS

A. Provide Niagara Tridium building controller for new air-handling unit and integrate into existing building controller.

B. Basic Unit Controls:

1. Control-voltage transformer.
2. Wall-mounted thermostat or sensor with the following features:
   a. Heat-cool-off switch.
   b. Fan on-auto switch.
   c. Fan-speed switch.
   d. Automatic changeover.
   e. Adjustable deadband.
   f. Concealed set point.
   g. Concealed indication.
   h. Degree F indication.
   i. Unoccupied-period-override push button.
   j. Data entry and access port to input temperature and humidity set points, occupied and unoccupied periods, and output room temperature and humidity, supply-air temperature, operating mode, and status.

2.10 ACCESSORIES

A. Duplex, 115-V, ground-fault-interrupter outlet with 15-A overcurrent protection. Include transformer if required. Outlet shall be energized even if the unit main disconnect is open.

B. Low-ambient kit using staged condenser fans for operation down to 35 deg F .

C. Filter differential pressure switch with sensor tubing on either side of filter. Set for final filter pressure loss.

D. Coil guards of painted, galvanized-steel wire.

2.11 ROOF CURBS

A. Roof curbs with vibration isolators and wind or seismic restraints are specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."

B. Materials: Galvanized steel with corrosion-protection coating, watertight gaskets, and factory-installed wood nailer; complying with NRCA standards.

1. Curb Insulation and Adhesive: Comply with NFPA 90A or NFPA 90B.
   a. Materials: ASTM C 1071, Type I or II.
   b. Thickness: 1 inch .

2. Application: Factory applied with adhesive and mechanical fasteners to the internal surface of curb.
   a. Liner Adhesive: Comply with ASTM C 916, Type I.
   b. Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment, or welding attachment to duct without damaging liner when applied as recommended by manufacturer and without causing leakage in cabinet.

c. Liner materials applied in this location shall have air-stream surface coated with a temperature-resistant coating or faced with a plain or coated fibrous mat or fabric depending on service air velocity.
d. Liner Adhesive: Comply with ASTM C 916, Type I.

C. Curb Height: 6 inches .

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of RTUs.

B. Examine roughing-in for RTUs to verify actual locations of piping and duct connections before equipment installation.

C. Examine roofs for suitable conditions where RTUs will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Roof Curb: Install on roof structure or concrete base, level and secure, according to NRCA's "Low-Slope Membrane Roofing Construction Details Manual," Illustration "Raised Curb Detail for Rooftop Air Handling Units and Ducts." Install RTUs on curbs and coordinate roof penetrations and flashing with roof construction specified in Division 07 Section "Roof Accessories." Secure RTUs to upper curb rail, and secure curb base to roof framing or concrete base with anchor bolts.

3.3 CONNECTIONS

A. Install condensate drain, minimum connection size, with trap and indirect connection to nearest roof drain or area drain.

B. Install piping adjacent to RTUs to allow service and maintenance.

1. Gas Piping: Comply with applicable requirements in Division 23 Section "Facility Natural-Gas Piping." Connect gas piping to burner, full size of gas train inlet, and connect with union and shutoff valve with sufficient clearance for burner removal and service.

C. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts. The following are specific connection requirements:

1. Install ducts to termination at top of roof curb.
2. Remove roof decking only as required for passage of ducts. Do not cut out decking under entire roof curb.

3. Connect supply ducts to RTUs with flexible duct connectors specified in Division 23 Section "Air Duct Accessories."
4. Install return-air duct continuously through roof structure.
5. Install normal-weight, 3000-psi, compressive strength (28-day) concrete mix inside roof curb, 4 inches thick. Concrete, formwork, and reinforcement are specified in Division 03.

D. If objectionable noise or vibration is produced or transmitted to or through the building structure by equipment piping, ducts, or other parts of the work, the Contractor shall rectify such conditions without cost to the Contract. If the item of equipment is judged to produce objectionable noise or vibration, demonstrate without cost to the Contract that the equipment performs within the designated vibration limits specified.

E. Where inlet and outlet ductwork at any fan is changed from that shown on drawings, submit scaled layout of the change and system effect factor calculations, indicating increased static pressure requirements as described in AMCA Publication 201. The Contractor shall be responsible for any motor, drive and/or wiring changes required as result of duct configuration changes at the fan.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.

B. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Report results in writing.

C. Tests and Inspections:

1. After installing RTUs and after electrical circuitry has been energized, test units for compliance with requirements.
2. Inspect for and remove shipping bolts, blocks, and tie-down straps.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Complete installation and startup checks according to manufacturer's written instructions and do the following:

1. Inspect for visible damage to unit casing.
2. Inspect for visible damage to furnace combustion chamber.
3. Inspect for visible damage to compressor, coils, and fans.
4. Inspect internal insulation.
5. Verify that labels are clearly visible.
6. Verify that clearances have been provided for servicing.
7. Verify that controls are connected and operable.
8. Verify that filters are installed.
9. Clean condenser coil and inspect for construction debris.
10. Clean furnace flue and inspect for construction debris.
11. Connect and purge gas line.
12. Remove packing from vibration isolators.
13. Inspect operation of barometric relief dampers.
14. Verify lubrication on fan and motor bearings.
15. Inspect fan-wheel rotation for movement in correct direction without vibration and binding.
16. Adjust fan belts to proper alignment and tension.
17. Start unit according to manufacturer's written instructions.
    a. Start refrigeration system.
    b. Do not operate below recommended low-ambient temperature.
    c. Complete startup sheets and attach copy with Contractor's startup report.
18. Inspect and record performance of interlocks and protective devices; verify sequences.
19. Operate unit for an initial period as recommended or required by manufacturer.
20. Perform the following operations for both minimum and maximum firing. Adjust burner for peak efficiency.
    a. Measure gas pressure on manifold.
    b. Inspect operation of power vents.
    c. Measure combustion-air temperature at inlet to combustion chamber.
    d. Measure flue-gas temperature at furnace discharge.
    e. Perform flue-gas analysis. Measure and record flue-gas carbon dioxide and oxygen concentration.
    f. Measure supply-air temperature and volume when burner is at maximum firing rate and when burner is off. Calculate useful heat to supply air.
21. Calibrate thermostats.
22. Adjust and inspect high-temperature limits.
23. Inspect outdoor-air dampers for proper stroke and interlock with return-air dampers.
24. Start refrigeration system and measure and record the following when ambient is a minimum of 15 deg F above return-air temperature:
    a. Coil leaving-air, dry- and wet-bulb temperatures.
    b. Coil entering-air, dry- and wet-bulb temperatures.
    c. Outdoor-air, dry-bulb temperature.
    d. Outdoor-air-coil, discharge-air, dry-bulb temperature.
25. Inspect controls for correct sequencing of heating, mixing dampers, refrigeration, and normal and emergency shutdown.
26. Measure and record the following minimum and maximum airflows. Plot fan volumes on fan curve.
    a. Supply-air volume.
    b. Return-air volume.

c. Relief-air volume.
d. Outdoor-air intake volume.

27. Simulate maximum cooling demand and inspect the following:
    a. Compressor refrigerant suction and hot-gas pressures.
    b. Short circuiting of air through condenser coil or from condenser fans to outdoor-air intake.

28. Verify operation of remote panel including pilot-light operation and failure modes. Inspect the following:
    a. High-temperature limit on gas-fired heat exchanger.
    b. Low-temperature safety operation.
    c. Filter high-pressure differential alarm.
    d. Economizer to minimum outdoor-air changeover.
    e. Relief-air fan operation.
    f. Smoke and firestat alarms.

29. After startup and performance testing and prior to Substantial Completion, replace existing filters with new filters.

3.6 CLEANING AND ADJUSTING

A. After completing system installation and testing, adjusting, and balancing RTU and air-distribution systems, clean filter housings and install new filters.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Government's maintenance personnel to adjust, operate, and maintain RTUs. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 237413

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design seismic supports and seismic bracing.

B. Seismic Performance: Electrical systems as described in Division 26 shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.2 DESCRIPTION

A. Work to be performed under the sections of Division 26 includes all labor, materials, and equipment required to install complete electrical systems as described in these specifications and as shown on the drawings. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections.

B. Before submitting a bid, the Contractor shall examine the drawings and specifications, visit the work site, and be informed of local conditions, all federal, state and local ordinances, regulations and all other pertinent items which may affect cost, schedule, and completion of this project.

C. Drawings accompanying these specifications are a part of these specifications. Drawings are intended to show general arrangement, design, and extent of work and are diagrammatic. Drawings are not intended to show exact locations except where dimensions are shown. Any substantial differences existing between drawings and conditions in the field shall be submitted to the Engineer for consideration before proceeding with work. Electrical work is shown on plans using standard industry symbols.

D. Before ordering materials or doing work, the Contractor shall verify all measurements pertaining to work scope and assume installation responsibility for complete and fully functional electrical systems.

E. The electrical work included in all other divisions of this specification and related documents is the responsibility of the contractor performing the division 26 work unless specifically noted otherwise.

1.3 REFERENCED STANDARDS

A. Abbreviations of standards organizations referenced in this, and other sections are as follows:

1.4 QUALITY ASSURANCE

A. Manufacturer references used herein are intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

B. Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and the assigned space and for obtaining the performance from the system into which these items are placed.

C. All materials shall be listed by and shall bear the label of an approved electrical testing laboratory. If none of the approved electrical testing laboratories has published standards for a particular item, then other national independent testing standards, subject to approval by the Engineer, shall apply and such items shall bear those labels. Where one of the approved electrical testing laboratories has an applicable system listing and label, the entire system shall be so labeled. The Contractor shall not modify new equipment in such a way as to nullify the Testing Laboratories label. All equipment and materials shall be used or installed in accordance with any instruction included in the listing by the laboratory.

1.5 DEFINITIONS

1.6 REGULATORY REQUIREMENTS

A. All work and materials are to conform in every detail to applicable rules and requirements of local codes and regulations, the National Electrical Code (NFPA 70), other applicable National Fire Protection Association codes, and current manufacturing standards (including NEMA) and any additional local modifications enacted by the Local Authority Having Jurisdiction. Contractor shall be responsible to verify what if any local modifications are in place or enacted by the Local Authority Having Jurisdiction.

B. All work shall be installed in accordance with NECA standards of installation.

C. All work shall conform where applicable to the Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA), Part 1910, “Occupational Safety and Health Standards.” This shall include any local or state modifications enacted by the Authority having Jurisdiction.

1.7 CONTINUITY OF EXISTING SERVICES AND SYSTEMS

A. No outages shall be permitted on existing systems except at the time and during the interval specified by the Owner. The Construction Manager] Owner may require written approval. Any outage must be scheduled when the interruption causes the least interference with normal

Owner schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Owner at least seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Owner's written permission.

C. This Contractor shall restore any circuit interrupted as a result of this work to proper operation as soon as possible.

1.8 TEMPORARY CONSTRUCTION POWER

A. Provide temporary lighting and construction power for the project. Pay the usage charges to the serving utility for electric service associated with temporary lighting and power for construction.

1.9 OMISSIONS

A. No later than ten (10) days before bid opening The Contractor shall call to the attention of the Engineer any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

1.10 ACTION SUBMITTALS

A. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name or number, as indicated in the contract documents. Failure to do this may result in the submittal(s) being returned to the Contractor for correction and resubmission. Failing to follow these instructions does not relieve the Contractor from the requirement of meeting the project schedule.

1. On request, the Contractor shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc. to clarify intent of construction or operations.
2. Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.
3. The submittals must be approved before fabrication.

B. Delegated-Design Submittal: For seismic restraints.

1. Seismic-Restraint Details: Signed and sealed by a qualified professional engineer, licensed in the state where Project is located, who is responsible for their preparation.
2. Design Calculations: Calculate requirements for selecting seismic restraints.

3. Detail fabrication, including anchorages and attachments to structure and to supported MCCs, switches, transfer switches, switchgear, panelboards, switchboards, overcurrent protective devices, transformers, light fixtures, lighting control panels, enclosed controllers, power distribution units, paralleling low voltage switchgear, enclosed controllers, variable frequency motor controllers, engine generators, central battery equipment, UPSs, power factor correction equipment, enclosed bus assemblies and cable trays.

C. Manufacturer Seismic Qualification Certification: Submit certification that cable trays, MCCs, switches, transfer switches, switchgear, panelboards, switchboards, overcurrent protective devices, transformers, light fixtures, lighting control panels, enclosed controllers, variable frequency motor controllers, engine generators, central battery equipment, UPSs, power factor correction equipment, enclosed bus assemblies, power distribution units, paralleling low voltage switchgear, electricity metering and associated accessories, and components will withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.11 PROJECT/SITE CONDITIONS

A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of work to meet Project conditions, including changes to work specified in other Sections. Obtain written permission of Engineerbefore proceeding.

C. Tools, materials, and equipment shall be confined to areas designated by the Construction Manager.

1.12 WORK SEQUENCE AND SCHEDULING

A. See the General Conditions of the Contract, Scheduling and Coordination of Work, and Time for Completion of the Project, and General Requirements, Mutual Responsibility for additional requirements.

1.13 WORK BY OTHER TRADES

A. Every attempt has been made to indicate in this trade's specifications and drawings all work required of this Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda, and additional notes on drawings for other trades which pertain to this Trade's work, and thus those additional requirements are hereby made a part of these specifications and drawings.

B. Electrical details on drawings for equipment to be provided by others is based on preliminary design data only. This Contractor shall lay out the electrical work and shall be responsible for its correctness to match equipment actually provided by others.

1.14 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Refer to Division 1, General Requirements, Operating and Maintenance Instructions for additional requirements.

1.15 TRAINING

A. Instruct Owner's personnel in the proper operation and maintenance of systems and equipment provided as part of this project; video record all training sessions. Use the Operating and Maintenance manuals during this instruction. Demonstrate startup and shutdown procedures for all equipment. All training to be during normal working hours.

B. The requirement for recording training sessions may be deleted on some projects but not the requirement for the training itself.

C. Refer to other sections in Division 26 for specific section and equipment training requirements.

1.16 RECORD DRAWINGS

A. [Contractor shall provide drawings to document as-built conditions per Division 1.

B. A set of prints shall be kept at the job site upon which all changes and deviations from the original design are to be recorded daily. All changes shall be clearly marked. These drawings shall indicate as a minimum, all changes made to the drawings, changes in circuiting, equipment location, accurate locations of embedded conduit, and all other significant changes and deviations from the original design.

C. The daily record of changes shall be the responsibility of the Contractor's field representative. No arbitrary mark-ups will be permitted.

D. The record drawing set shall be made available and may be audited periodically by the Engineer to assure the changes are being recorded.

E. At the completion of the project, the Contractor shall submit the marked-up record drawings to the Owners' construction representative prior to request for final payment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Reference applicable sections within Division 26.

PART 3 - EXECUTION

3.1 WORK INCLUDED

A. The scope of work shall include all work, including all labor, materials and equipment, testing required to install a complete electrical system as indicated in the project Manual. The Project Manual consists of the bidding documents, the contract, specifications, contract drawings and all subsequent addenda and modifications. The contractor shall furnish and install all necessary materials, apparatus, and devices to complete the electrical equipment and systems installation herein specified, except such parts as are specifically exempted herein.

B. All work items shown on the drawings is within the scope of work and shall be provided as indicated. Only items that are clearly indicated as being provided by others or under a separate contract shall be out of scope.

C. In general, the specifications indicate the requirements and quality for products required and the executions for those products. Only items that are clearly indicated as being provided by others or under a separate contract shall be out of scope.

D. If there is any discrepancy between the drawings and the specifications, it is the contractor’s responsibility to notify the Engineer for resolution, prior to procuring equipment or starting work.

E. Coordinate and verify all equipment being supplied by equipment supplier and other trades. Verify equipment size, motor HP, dimensions, locations, etc. as all are subject to change.

F. Contractor shall verify all door swings and the location of all cabinets, diffusers, HVAC, plumping, process and building equipment before installing electrical equipment, fixtures, outlets, and conduit.

G. The Contractor shall provide all plywood backboards and supports for all electrical equipment as indicated on the drawings and as required or specified.

H. All permits and inspection fees required to complete the work shall be paid for by the Contractor unless noted otherwise.

I. All electrical equipment and fixtures shall be installed in complete accordance with the manufacturers' recommendations.

J. Contractor shall provide all motor connections as shown on the drawings and as specified herein.

3.2 CONCRETE

A. All concrete work required for the proper installation of electrical equipment including transformer(s), switchboard(s), switchgear and motor control center pads and other equipment pads shall be provided by the Contractor and shall conform to specifications in Division 3.

3.3 SITE WORK

A. The Contractor shall provide excavation and backfill for all electrical underground work as indicated on the drawings and as required. The Contractor shall perform this work and provide compaction as specified in Division 2. Finish grading and final restoration shall be by the General Contractor.

3.4 CONFIRMATION OF ELECTRIC SERVICE

A. Consult with Electric Utility to verify service information specified herein and shown on drawings before submitting bid.

B. The Electrical Contractor shall initiate the electrical service application.

3.5 PERMITS, FEES, TAXES, INSPECTIONS

A. Procure all applicable permits and licenses.

B. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.

C. ELECTRICAL CONTRACTOR to pay all charges for permits or licenses.

D. Pay all fees and taxes imposed by State, Municipal, and other regulatory bodies.

E. Pay all charges arising out of required inspections by an authorized body.

F. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.

G. Where applicable, all fixtures, equipment and materials shall be listed by Underwriter’s Laboratories, Inc. or a nationally recognized testing organization.

3.6 METERING

A. Consult with Electric Utility regarding service entrance requirements and metering equipment.

B. Install metering equipment and empty conduit for metering conductors to meet standards and requirements of Electric Utility.

C. Refer to Specification Section 262713 “Electricity Metering” for additional information.

3.7 SERVICE INSTALLATION

A. The service installation shall comply with the latest applicable standards of the utility. Refer to the current electrical service installation manuals.

B. The Contractor shall meet with the electric utility prior to rough-in to review and coordinate the installation of the electrical service and verify existing conditions and specific requirements.

3.8 BUILDING ACCESS

A. Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

3.9 EQUIPMENT ACCESS

A. Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the and reimburse the General Contractor for installation of those access doors.

3.10 COORDINATION

A. The Contractor shall cooperate with other trades and the Owner’s construction representative in locating work in a proper manner. Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost, provided such decision is reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.

B. The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to, light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating units installed in/on architectural surfaces.

C. Coordinate all work with other trades prior to installation. Any installed work that is not coordinated and that interferes with another trades work shall be removed or relocated at the installing contractor's expense.

3.11 HOUSEKEEPING AND CLEAN UP

A. Refer to Division 1, General Requirements, and Cleaning for additional requirements.

B. The Contractor shall clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, the Contractor shall remove all tools, excess material and equipment, etc., from the site.

END OF SECTION 260500

SECTION 260502 - ELECTRICAL DEMOLITION AND ALTERATION

PART 1 - GENERAL

1.1 COORDINATION

A. Coordinate sequencing with Owner and other Contractors. Coordinate scope of work with all other Contractors and the Owner at the project site. Schedule removal of equipment and electrical service to avoid conflicts.

1.2 SUMMARY

A. Electrical Demolition

B. The drawings are intended to indicate the scope of work required and do not indicate every box, conduit, or wire that must be removed. The Contractor shall visit the site prior to submitting a bid and verify existing conditions.

1.3 CONTINUITY OF EXISTING SERVICES SYSTEMS

A. No outages shall be permitted on existing systems except at the time and during the interval specified by the Owner. The Owner may require written approval. Any outage must be scheduled when the interruption causes the least interference with normal Owner schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.

B. This Contractor shall restore any circuit interrupted as a result of this work to proper operation as soon as possible.

C. Prior to demolition or alteration of structures, the following shall be accomplished:

1. Owner release of structure.
2. Disconnection of electrical power to utilization equipment and circuits removed or affected by demolition work.
3. Electrical services rerouted or shut off outside area of demolition.
4. Survey and record condition of existing facilities to remain in place that may be affected by demolition operations. After demolition operations are completed, survey conditions again and restores existing facilities to their predemolition condition.
5. Notify utilities prior to razing operations to permit them to disconnect and remove or relocate equipment that served existing facilities.
6. Contractor shall notify Architect/Engineer of existing code violations observed during the course of performing his work. If corrective action needs to be taken that changes the scope of the work, corrective action to proceed only after approved by Architect/Engineer.

7. Provide temporary wiring and connections to maintain existing systems in service during construction. Assume all equipment and systems must remain operational unless specifically noted otherwise on drawings.
8. Existing Electrical Service: Maintain existing system in service until new system is completed and ready for service. Disable system only to make switchovers and connections. Obtain permission no fewer than **seven** days in advance of proposed interruption of electric service before partially or completely [48 [Insert #] disabling system. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area. Do not proceed with interruption of electric service without Owner's written permission.
9. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Obtain permission and no fewer than seven days in advance of proposed interruption of Fire Alarm System before partially or completely disabling systems. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area. . Do not proceed with interruption without Owner's written permission.
10. Existing Communications Data System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission no fewer than seven days in advance of proposed interruption of Communications Data System before partially or completely disabling systems. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area. Do not proceed with interruption without Owner's written permission.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work as specified in the individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit and wire to facilities and equipment that will remain in operation following demolition. Extension of conduit and wire to equipment shall be compatible with the surrounding area.

3.2 PREPARATION

A. Where walls, ceilings, structures, etc., are indicated as being renovated and/or removed on general drawings, the Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, raceways, wiring, systems, etc., from the removed area.

B. Where ceilings, walls, structures, etc., are temporarily removed and replaced by others, this Contractor shall be responsible for the removal, storage, and replacement of equipment, devices, fixtures, raceways, wiring, systems, etc.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed. Patch openings created from removal of devices to match surrounding finishes.

B. Repair adjacent construction and finishes damaged during demolition and extension work. Patch openings to match existing surrounding finishes.

C. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

D. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. This includes the extension of the circuit from the last active device to the next device in the system to be activated.

E. Equipment removal in certain locations may require the installation of a junction box to reconnect circuits that remain in operation. Extend conduit and wiring as required to maintain power to remaining equipment.

F. Contractor shall remove and install all ceiling tiles as required for the execution of electrical work that is outside the contract limits of construction. Contractor shall replace ceiling tiles with identical material where damaged by this Contractor.

G. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

H. Ballasts in light fixtures installed prior to 1980 shall be incinerated in EPA approved incinerator or disposed of in EPA certified containers and deposited in an EPA landfill certified for PCB disposal or recycled by permitted ballast recycler. Punctured or leaking ballasts must be disposed of according to Federal Regulations under the Toxic Substance Control Act. Provide Owner and Architect/Engineer with a Certificate of Destruction to verify proper disposal.

I. HID and fluorescent lamps, determined by the Toxicity Characteristic Leachate procedure (TCLP), to be hazardous waste shall be disposed of in a permitted hazardous waste disposal facility or by a permitted lamp recycler.

J. Floor slab is post-tensioned. All penetrations shall be x-rayed prior to cutting and/or drilling to avoid any tension cables or utilities encased in floor construction.

K. Floor slabs may contain conduit systems. This Contractor is responsible for taking any measures required to ensure no conduits or other services are damaged. This includes x-ray or similar non-destructive means.

L. Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.4 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment that remain or are to be reused.

B. Panelboards: Within the project scope. Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

C. Luminaries: Remove existing luminaires for cleaning. Use mild detergent to clean all exteriors and interior surface, rinse with clean water and wipe dry. Replace lamps, ballasts, and broken electrical parts. Replacement parts shall match specified components for new fixtures of same type when applicable.

D. Electrical items (i.e., lighting fixtures, panelboard motor controllers, disconnects, switches, conduit, wire, etc.) Removed and not relocated remain the property of the owner. The contractor shall dispose of material the owner does not want.

3.5 ASBESTOS REMOVAL

A. If this Contractor shall discover the presence of asbestos material, he shall cease work immediately and notify Owner architect and Engineer of condition.

3.6 INSTALLATION

A. Install relocated materials and equipment under the provisions of Division 26 Specifications.

END OF SECTION 260502

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alpha Wire.
2. Belden Inc.
3. Encore Wire Corporation.
4. General Cable Technologies Corporation.
5. Southwire Incorporated.

B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-THWN-2 Type XHHW-2 and Type UF.

D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC with ground wire.

E. VFC Cable:

1. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.
2. Type TC-ER with oversized crosslinked polyethylene insulation, spiral-wrapped foil plus 85 percent coverage braided shields and insulated full-size ground wire, and sunlight- and oil-resistant outer PVC jacket.
3. Conductor sizes shown on drawings are based on 75 Degree C copper.
4. All conductors shall be rated 600 volts.
5. Branch circuit wire sizes not shown on the drawings shall be #12 AWG minimum.
6. All emergency system wiring shall be installed in raceways separate from other systems.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Gardner Bender.
3. Hubbell Power Systems, Inc.
4. Ideal Industries, Inc.
5. Ilsco; a branch of Bardes Corporation.
6. NSi Industries LLC.
7. O-Z/Gedney; a brand of the EGS Electrical Group.
8. Thomas and Betts Corp.
9. 3M; Electrical Markets Division.
10. Tyco Electronics.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

1. Split Bolt Connectors: Not acceptable.
2. Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment pads or terminals. Not approved for splicing.
3. Spring Wire Connectors: Solderless spring type pressure connector with insulating covers for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller.
4. All wire connectors used in underground or exterior pull boxes shall be gel filled twist connectors or a connector designed for damp and wet locations.
5. Mechanical Connectors: Bolted type tin-plated; high conductivity copper alloy; spacer between conductors; beveled cable entrances.
6. Compression (crimp) Connectors: Long barrel; seamless, tin-plated electrolytic copper tubing; internally beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and location of crimps.

2.3 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders: Type THHN-THWN-2, single conductors in raceway.

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN-2, single conductors in raceway or Metal-clad cable, Type MC.

C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

D. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN-2, single conductors in raceway.

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN-2, single conductors in raceway.

F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

G. VFC Output Circuits: Type XHHW-2 in metal conduit with braided shield.

3.3 INSTALLATION OF FEEDERS AND BRANCH CIRCUITS

A. Feeder and branch circuit routing is shown diagrammatically on the drawings and is approximate unless dimensioned. Route feeders and branch circuits as required to meet project conditions.

B. All 120 and 277 volt branch circuits shall have a dedicated neutral conductor. The neutral conductor shall be considered current-carrying conductor for wire derating. The use of multi-wire branch circuits with a common neutral is not permitted.

C. All power wiring shall be installed in conduit unless specifically indicated otherwise.

D. Conceal feeders and branch circuits in finished walls, ceilings, and floors, unless otherwise indicated.

E. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

F. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

G. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

H. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

I. Install exposed feeders and branch circuits parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

J. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

K. Support feeders and branch circuits according to Division 26 Section "Hangers and Supports for Electrical Systems."

L. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

D. Test and Inspection Reports: Prepare a written report to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

E. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

B. Section includes grounding and bonding systems and equipment, plus the following special applications:

1. Underground distribution grounding.
2. Ground bonding common with lightning protection system.
3. Foundation steel electrodes.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:

1. Test wells.
2. Ground rods.
3. Ground rings.
4. Grounding arrangements and connections for separately derived systems.

B. Qualification Data: For testing agency and testing agency's field supervisor.

C. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
   a. Instructions for periodic testing and inspection of grounding features at test wells ground rings based on NFPA 70B.
      1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
      2) Include recommended testing intervals.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member Company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Burndy; Part of Hubbell Electrical Systems.
2. Dossert; AFL Telecommunications LLC.
3. ERICO International Corporation.
4. Fushi Copperweld Inc.
5. Galvan Industries, Inc.; Electrical Products Division, LLC.
6. Harger Lightning and Grounding.
7. ILSCO.
8. O-Z/Gedney; A Brand of the EGS Electrical Group.
9. Robbins Lightning, Inc.
10. Siemens Power Transmission & Distribution, Inc.

2.2 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

C. Grounding Bus (EGB): Rectangular bars of annealed copper, 1/4 by 2in cross section,Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.5 GROUNDING ELECTRODES

PART 3 - EXECUTION

3.1 APPLICATIONS

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.3 PERFORMANCE REQUIREMENTS

A. Provide supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Provide equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Allied Tube & Conduit.
   b. Cooper B-Line, Inc.; a division of Cooper Industries.
   c. ERICO International Corporation.
   d. GS Metals Corp.
   e. Thomas & Betts Corporation.
   f. Unistrut; Tyco International, Ltd.
   g. Wesanco, Inc.

2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
5. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1) Hilti Inc.
      2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.

3) MKT Fastening, LLC.
4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used. Plastic type expansion anchors are unacceptable.
   a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      1) Cooper B-Line, Inc.; a division of Cooper Industries.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti Inc.
      4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      5) MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps and single-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

E. All supports installed outside, exposed to the weather, or inside in wet or damp areas shall utilize corrosion resistant supports, fittings, hardware, conduit clamps and all accessories.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb..

C. All electrical fixtures, devices, and equipment shall be securely mounted to building structure and shall not depend upon ceiling or wall surfaces for their support. They shall be incapable of being rotated or displaced.

D. Do not fasten supports to piping, ductwork, mechanical equipment, cable tray, conduit, or any other surface not a part of the building structure or other structural surface.

E. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 Spring-tension clamps.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

F. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

G. Do not drill or weld structural steel members unless approved by Engineer.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touchup: Comply with requirements in Section 099113 "Exterior Painting" Section 099123 "Interior Painting" and for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Nonmetallic conduits and fittings.
3. Metal wireways and auxiliary gutters.
4. Boxes, enclosures, and cabinets.

1.3 ACTION SUBMITTALS

A. Product Data: For wireways and fittings, hinged-cover enclosures, and cabinets.

B. Sustainable Design Submittals:

1. Product Data: For solvents and adhesives, indicating VOC content.
2. Laboratory Test Reports: For solvents and adhesives, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Data: Certificates, for enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.

D. Source quality-control reports.

1.5 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

END OF SECTION 260533

SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and fittings, including RMC.
2. Rigid nonmetallic duct.
3. Duct accessories.
4. Precast concrete handholes.
5. Polymer concrete handholes and boxes with polymer concrete cover.

1.2 ACTION SUBMITTALS

A. Shop Drawings:

1. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:
   a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
   b. Include duct entry provisions, including locations and duct sizes.
   c. Include cover design.
   d. Include grounding details.
   e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.3 FIELD CONDITIONS

A. Ground Water: Assume ground-water level is 36 inches below ground surface unless a higher water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND FITTINGS

A. RMC: Comply with ANSI C80.1 and UL 6.

2.2 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct: Type EPC-80-PVC and Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Allied Tube and Conduit; a part of Atkore International.
2. CANTEX INC.
3. Kraloy.
4. Lamson & Sessions; Carlon Electrical Products.
5. Thomas & Betts Corporation; A Member of the ABB Group.

C. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 FLEXIBLE NONMETALLIC DUCTS

A. HDPE Duct: Type EPEC-40 HDPE, complying with NEMA TC 7 and UL 651A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
   a. ARNCO Corp.
   b. Carlon; a brand of Thomas & Betts Corporation.
   c. Premier Conduit.

B. Continuous HDPE: Comply with UL651A

2.4 DUCT ACCESSORIES

A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.

B. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

2.5 PRECAST CONCRETE HANDHOLES AND BOXES

A. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Jensen Precast.
2. Oldcastle Precast, Inc.
3. Utility Concrete Products, LLC.

C. Comply with ASTM C 858 for design and manufacturing processes.

D. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.

E. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

F. Cover Legend: Molded lettering, as indicated for each service.

G. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.

H. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.

1. Extension shall provide increased depth of 12 inches.
2. Slab: Same dimensions as bottom of enclosure and arranged to provide closure.

I. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

J. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

1. Type and size shall match fittings to duct to be terminated.
2. Fittings shall align with elevations of approaching duct and be located near interior corners of handholes to facilitate racking of cable.

K. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.6 POLYMER CONCRETE HANDHOLES AND BOXES WITH POLYMER CONCRETE COVER

A. Description: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Armorcast Products Company.
2. Oldcastle Enclosure Solutions.
3. Quazite: Hubbell Power Systems, Inc.

C. Standard: Comply with SCTE 77. Comply with tier requirements in "Underground Enclosure Application" Article.

D. Color: Gray.

E. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.

F. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.

G. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

H. Cover Legend: Molded lettering, as indicated for each service.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of duct, duct bank handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Coordinate elevations of duct and duct-bank entrances into handholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by Architect.

C. Clear and grub vegetation to be removed and protect vegetation to remain according to Section 311000 "Site Clearing." Remove and stockpile topsoil for reapplication according to Section 311000 "Site Clearing."

3.2 UNDERGROUND DUCT APPLICATION

A. Duct for Electrical Feeders 600 V and Less: Type EPC-40-PVC RNC, direct-buried unless otherwise indicated.

B. Duct for Electrical Branch Circuits: Type EPC-40-PVC RNC, direct-buried unless otherwise indicated.

C. Bored Underground Duct: Type EPEC-40-HDPE unless otherwise indicated.

D. Stub-ups: Concrete-encased RMC.

3.3 UNDERGROUND ENCLOSURE APPLICATION

A. Handholes and Boxes for 600 V and Less:

1. Units in Roadways, Air Side Apron and Other Deliberate Traffic Paths: Precast concrete. AASHTO HB 17, H-10 structural load rating.
2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Tier 15 structural load rating.

3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer concrete units, SCTE 77, Tier 8 structural load rating.
4. Units Subject to Light-Duty Pedestrian Traffic Only: Polymer concrete units, SCTE 77, Tier 8.
5. Cover design load shall not exceed the design load of the handhole or box.

3.4 EARTHWORK

A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restoration: Replace area after construction vehicle traffic in immediate area is complete.

C. Restore surface features at areas disturbed by excavation and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary top soiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."

E. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures according to "Cutting and Patching" Article in Section 017300 "Execution."

3.5 DUCT AND DUCT-BANK INSTALLATION

A. Where indicated on Drawings, install duct, spacers, and accessories into the duct-bank configuration shown. Duct installation requirements in this Section also apply to duct bank.

B. Install duct according to NEMA TCB 2.

C. Slope: Pitch duct a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope duct from a high point between two manholes, to drain in both directions.

D. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.

1. Duct shall have maximum of two 90-degree bends, or the total of all bends shall be no more 180 degrees between pull points.

E. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent duct do not lie in same plane.

F. Terminator Entrances to Concrete Handholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c for 4-inch duct and vary proportionately for other duct sizes.

1. Begin change from regular spacing to terminator spacing 10 feet from the terminator, without reducing duct line slope and without forming a trap in the line.

G. Building Wall Penetrations: Make a transition from underground duct to RMC at least 10 feet outside the building wall, without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for RNC-to-RMC transition. Install RMC penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

H. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

I. Pulling Cord: Install 200-lbf- test nylon cord in empty ducts.

J. Direct-Buried Duct and Duct Bank:

1. Excavate trench bottom to provide firm and uniform support for duct. Comply with requirements in Section 312000 "Earth Moving" for preparation of trench bottoms for pipes less than 6 inches in nominal diameter.
2. Width: Excavate trench 12 inches wider than duct on each side.
3. Width: Excavate trench 3 inches wider than duct on each side.
4. Depth: Install top of duct at least 36 inches below finished grade unless otherwise indicated.
5. Set elevation of bottom of duct bank below frost line.
6. Install duct with a minimum of 3 inches between ducts for like services and 6 inches between power and communications duct.
7. Elbows: Install manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct direction unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
8. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over duct and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction. Comply with requirements in Section 312000 "Earth Moving" for installation of backfill materials.
    a. Place minimum 3 inches of sand as a bed for duct. Place sand to a minimum of 6 inches above top level of duct.
    b. Place minimum 6 inches of engineered fill above concrete encasement of duct.

K. Horizontal Directional Drilling

1. Entire drill path shall be accurately surveyed, with entry and exit stakes placed and coordinated with other contractors. If using a magnetic guidance system, entire drill path shall be surveyed for any surface geo-magnetic variations or anomalies.
2. Any utility locates within 20 feet of the bore path shall have the exact location physically verified by hand digging or vacuum excavation. Restore inspection holes to original condition after verification.

L. Underground-Line Warning Tape: Bury conducting underground line specified in Section 260553 "Identification for Electrical Systems" no less than 12 inches above all concrete-encased duct and duct banks and approximately 12 inches below grade. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

3.6 INSTALLATION OF CONCRETE HANDHOLES, AND BOXES

A. Precast Concrete Handhole Installation:

1. Comply with ASTM C 891 unless otherwise indicated.
2. Install units level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

B. Elevations:

1. Install handholes with bottom below frost line, below grade.
2. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
3. Where indicated, cast handhole cover frame integrally with handhole structure.

C. Field-Installed Bolting Anchors in Concrete Handholes: Do not drill deeper than 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

3.7 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of duct, and seal joint between box and extension as recommended by manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch above finished grade.

D. Install handholes and boxes with bottom below frost line, below grade.

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch- long mandrel equal to duct size minus 1/4 inch. If obstructions are indicated, remove obstructions and retest.

B. Correct deficiencies and retest as specified above to demonstrate compliance.

C. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

D. Clean internal surfaces of manholes, including sump.

1. Sweep floor, removing dirt and debris.
2. Remove foreign material.

END OF SECTION 260543

SECTION 260548.16 - SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Restraint channel bracings.
2. Restraint cables.
3. Seismic-restraint accessories.
4. Mechanical anchor bolts.
5. Adhesive anchor bolts.

B. Related Requirements:

1. Section 260529, Hangers and Supports for Electrical Systems for commonly used electrical supports and installation requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
   a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an evaluation service member of ICC-ES.
   b. Annotate to indicate application of each product submitted and compliance with requirements.

B. Delegated-Design Submittal: For each seismic-restraint device.

1. Include design calculations and details for selecting seismic restraints complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Design Calculations: Calculate static and dynamic loading caused by equipment weight, operation, and seismic and wind forces required to select seismic and wind restraints and for designing vibration isolation bases.

a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

3. Seismic- and Wind-Restraint Details:
   a. Design Analysis: To support selection and arrangement of seismic and wind restraints. Include calculations of combined tensile and shear loads.
   b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
   c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.
   d. Preapproval and Evaluation Documentation: By an evaluation service member of ICC-ES, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

C. Qualification Data: For professional engineer.

D. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

B. Seismic-restraint devices shall have horizontal and vertical load testing and analysis. They shall bear anchorage preapproval by ICC-ES or another agency acceptable to authorities having jurisdiction. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) that support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Wind-Restraint Loading: Refer to Sheet S-001.

B. Seismic-Restraint Loading: Refer to Sheet S-001.

2.2 RESTRAINT CHANNEL BRACINGS

A. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end, with other matching components, and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.3 RESTRAINT CABLES

A. Restraint Cables: ASTM A603 galvanized-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.4 SEISMIC-RESTRAINT ACCESSORIES

A. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

B. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

C. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

D. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

E. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.5 MECHANICAL ANCHOR BOLTS

A. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E488.

2.6 ADHESIVE ANCHOR BOLTS

A. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E488.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an evaluation service member of ICC-ES.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods caused by seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Division 3.

B. Equipment and Hanger Restraints:

1. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
2. Install seismic-restraint devices using methods approved by an evaluation service member of ICC-ES providing required submittals for component.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

E. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

F. Drilled-in Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where connection is terminated to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.

B. Seismic controls will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.6 ADJUSTING

A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 260548.16

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

C. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.

B. Colors for Cables Carrying Circuits at 600 V and Less:

1. Black letters on an orange field.

2. Legend: Indicate voltage and system or service type.

C. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

E. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around cable it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.

2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.

B. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

C. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil-thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend.

D. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around cable it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.

E. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

F. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

G. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

2.4 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil-thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the conductor diameter such that the clear shield overlaps the entire printed legend.

C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of conductor it identifies and to stay in place by gripping action.

D. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve with diameter sized to suit diameter of conductor it identifies and to stay in place by gripping action.

E. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around conductor it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.

F. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

2.5 FLOOR MARKING TAPE

A. 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

2.6 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electricalutility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE,.

2.7 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.8 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

2.9 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

C. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

D. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.10 CABLE TIES

A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

2.11 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape with adhesive appropriate to the location and substrate.

G. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

J. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Snap-around labels. Install labels at 30-foot maximum intervals.

B. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.

C. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

1. Emergency Power.
2. Power.
3. UPS.

D. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
   a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
   b. Colors for 208/120-V Circuits:
      1) Phase A: Black.
      2) Phase B: Red.
      3) Phase C: Blue.
   c. Colors for 480/277-V Circuits:
      1) Phase A: Brown.
      2) Phase B: Orange.
      3) Phase C: Yellow.
   d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

E. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

F. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.

G. Control-Circuit Conductor Termination Identification: For identification at terminations provide heat-shrink preprinted tubes, self-adhesive vinyl labels with the conductor designation.

H. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.

I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

J. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

1. Limit use of underground-line warning tape to direct-buried cables.
2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

K. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels or Baked-enamel warning signs.

1. Comply with 29 CFR 1910.145.
2. Identify system voltage with black letters on an orange background.
3. Apply to exterior of door, cover, or other access.
4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
    a. Power transfer switches.
    b. Controls with external control power connections.

M. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

N. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

O. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
   a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
   b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
   c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
   d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:
   a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label.
   b. Enclosures and electrical cabinets.
   c. Access doors and panels for concealed electrical items.
   d. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
   e. Emergency system boxes and enclosures.
   f. Enclosed switches.
   g. Enclosed circuit breakers.
   h. Enclosed controllers.
   i. Variable-speed controllers.
   j. Push-button stations.
   k. Power transfer equipment.
   l. Contactors.
   m. Remote-controlled switches, dimmer modules, and control devices.
   n. Monitoring and control equipment.

END OF SECTION 260553

SECTION 260574 - OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.3 DEFINITIONS

A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.

C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.

D. SCCR: Short-circuit current rating.

E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Study Submittals: Submit the following submittals after the approval of system protective devices submittals. Submittals shall be in digital form.

1. Arc-flash study input data, including completed computer program input data sheets.
2. Arc-flash study report; signed, dated, and sealed by a qualified professional engineer.
    a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Arc-Flash Study Specialist.

B. Product Certificates: For arc-flash hazard analysis software, certifying compliance with IEEE 1584 and NFPA 70E.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Maintenance procedures according to requirements in NFPA 70E shall be provided in the equipment manuals.
2. Operation and Maintenance Procedures: In addition to items specified in Section 017823 "Operation and Maintenance Data," provide maintenance procedures for use by Owner's personnel that comply with requirements in NFPA 70E.

1.7 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

B. Arc-Flash Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

C. Arc-Flash Study Specialist Qualifications: Professional engineer in charge of performing the study, analyzing the arc flash, and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Comply with IEEE 1584 and NFPA 70E.

B. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT

A. Executive summary.

B. Study descriptions, purpose, basis and scope.

C. One-line diagram, showing the following:

1. Protective device designations and ampere ratings.
2. Cable size and lengths.
3. Transformer kilovolt ampere (kVA) and voltage ratings.
4. Motor and generator designations and kVA ratings.
5. Switchgear, switchboard, motor-control center and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Arc-Flash Study Output:

1. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
   a. Voltage.
   b. Calculated symmetrical fault-current magnitude and angle.
   c. Fault-point X/R ratio.
   d. No AC Decrement (NACD) ratio.
   e. Equivalent impedance.
   f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
   g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

F. Incident Energy and Flash Protection Boundary Calculations:

1. Arcing fault magnitude.
2. Protective device clearing time.
3. Duration of arc.
4. Arc-flash boundary.
5. Working distance.
6. Incident energy.
7. Hazard risk category.
8. Recommendations for arc-flash energy reduction.

G. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.

2.3 ARC-FLASH WARNING LABELS

A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for self-adhesive equipment labels. Produce a 3.5-by-5-inch self-adhesive equipment label for each work location included in the analysis.

B. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:

1. Location designation.
2. Nominal voltage.
3. Flash protection boundary.
4. Hazard risk category.
5. Incident energy.
6. Working distance.
7. Engineering report number, revision number, and issue date.

C. Labels shall be machine printed, with no field-applied markings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to arc-flash study may not be used in study.

3.2 ARC-FLASH HAZARD ANALYSIS

A. Comply with NFPA 70E and its Annex D for hazard analysis study.

B. Calculate maximum and minimum contributions of fault-current size.

1. The minimum calculation shall assume that the utility contribution is at a minimum and shall assume no motor load.
2. The maximum calculation shall assume a maximum contribution from the utility and shall assume motors to be operating under full-load conditions.

C. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.

D. Include medium- and low-voltage equipment locations, except equipment rated 240-V ac or less fed from transformers less than 125 kVA.

E. Safe working distances shall be specified for calculated fault locations based on the calculated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.

F. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators shall be decremented as follows:

1. Fault contribution from induction motors should not be considered beyond three to five cycles.
2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g., contributions from permanent magnet generators will typically decay from 10 per unit to three per unit after 10 cycles).

G. Arc-flash computation shall include both line and load side of a circuit breaker as follows:

1. When the circuit breaker is in a separate enclosure.
2. When the line terminals of the circuit breaker are separate from the work location.

H. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

3.3 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the arc-flash hazard analysis.

1. Verify completeness of data supplied on the one-line diagram on Drawings. Call discrepancies to the attention of Architect.
2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
3. For existing equipment, whether or not relocated, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers.

B. Electrical Survey Data: Gather and tabulate the following input data to support study. Comply with recommendations in IEEE 1584 and NFPA 70E as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.

1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
2. Obtain electrical power utility impedance at the service.
3. Power sources and ties.
4. Short-circuit current at each system bus, three phase and line-to-ground.
5. Full-load current of all loads.
6. Voltage level at each bus.
7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in per cent, and phase shift.

8. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
9. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
10. Motor horsepower and NEMA MG 1 code letter designation.
11. Low-voltage cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).
12. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.

3.4 LABELING

A. Apply one arc-flash label for 600-V ac, 480-V ac, and applicable 208-V ac panelboards and disconnects and for each of the following locations:

1. Control panel.
2. Panelboard

3.5 APPLICATION OF WARNING LABELS

A. Install the arc-fault warning labels under the direct supervision and control of the Arc-Flash Study Specialist.

3.6 DEMONSTRATION

A. Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the potential arc-flash hazards associated with working on energized equipment and the significance of the arc-flash warning labels.

END OF SECTION 260574

SECTION 260913 - ELECTRICAL POWER MONITORING AND CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following for monitoring of electrical power system:

1. Communication network and interface modules for RS-485, Modbus TCP/IP data transmission protocols.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Attach copies of approved Product Data submittals for products (such as switchboards and switchgear) that describe power monitoring and control features to illustrate coordination among related equipment and power monitoring and control.

B. Shop Drawings: For power monitoring and control equipment. Include plans, elevations, sections, details, and attachments to other work.

1. Outline Drawings: Indicate arrangement of components and clearance and access requirements.
2. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices to be used. Describe characteristics of network and other data communication lines.
3. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
4. Wiring Diagrams: For power, signal, and control wiring. Coordinate nomenclature and presentation with a block diagram.
5. UPS sizing calculations for workstation.
6. Surge Suppressors: Data for each device used and where applied.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified manufacturer.

B. Field quality-control reports.

C. Other Informational Submittals:

1. Manufacturer's system installation and setup guides, with data forms to plan and record options and setup decisions.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For power monitoring and control units, to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

1. Hard copies of manufacturer's specification sheets, operating specifications, design guides, user's guides for software and hardware, and PDF files on CD-ROM of the hard-copy submittal.

B. Software and Firmware Operational Documentation:

1. Self-study guide describing the process for setting equipment's network address; setting Owner's options; procedures to ensure data access from any PC on the network, using a standard Web browser; and recommended firewall setup.
2. Software operating and upgrade manuals.
3. Software Backup: On a magnetic media or compact disc, complete with Owner-selected options.
4. Device address list and the set point of each device and operator option, as set in applications software.
5. Graphic file and printout of graphic screens and related icons, with legend.

C. Software licenses and upgrades required by and installed for operating and programming digital and analog devices.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Addressable Relays: One for every 10 installed. Furnish at least one of each type.
2. Data Line Surge Suppressors: One for every 10 of each type installed. Furnish at least one of each type.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Manufacturer Qualifications: A firm experienced in manufacturing power monitoring and control equipment similar to that indicated for this Project and with a record of successful in-service performance.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.7 COORDINATION

A. Coordinate features of distribution equipment and power monitoring and control components to form an integrated interconnection of compatible components.

1. Match components and interconnections for optimum performance of specified functions.

B. Coordinate Work of this Section with those in Sections specifying distribution components that are monitored or controlled by power monitoring and control equipment.

1.8 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning with Substantial Completion, provide software support for two years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton Corporation; Cutler-Hammer products.
2. General Electric Company; GE Consumer & Industrial.
3. Landis+Gyr Inc.
4. Rockwell Automation, Inc.; Allen-Bradley brand.
5. Schneider Electric - Power Management Operation.

2.2 FUNCTIONAL DESCRIPTION

A. Instrumentation and Recording Devices: Monitor and record load profiles and chart energy consumption patterns.

1. Calculate and Record the Following:
   a. Load factor.

2. Peak demand periods.

B. Power Quality Monitoring: Identify power system anomalies and measure, display, and record trends and alarms of the following power quality parameters:

1. Voltage regulation and unbalance.
2. Continuous three-phase rms voltage.
3. Periodic max./min./avg. voltage samples.
4. Voltage excursions.

C. System: Report equipment status and power system control.

2.3 SYSTEM REQUIREMENTS

A. Monitoring and Control System: Include multiple PC-based workstations with graphics capability and Web access, with its operating system and application software, connected to data transmission network.

B. Surge Protection: For external wiring of each conductor entry connection to components to protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads.

1. Minimum Protection for Power Lines 120 V and More: Auxiliary panel suppressors complying with requirements in Section 264313 "Surge Protection for Low-Voltage Electrical Power Circuits."
2. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Lines: Comply with requirements as recommended by manufacturer for type of line being protected.

C. Addressable Devices: All transmitters and receivers shall communicate unique device identification and status reports to monitoring and control clients.

2.4 OPERATING SYSTEM

A. Software: Configured to run on a portable laptop computer, a single PC, or a palm computer, with capability for accessing a single meter at a time. System is not connected to a LAN. Modbus TCP/IP, RS-232, and RS-485 digital communications.

2.5 APPLICATIONS SOFTWARE

A. Basic Requirements:

1. Fully compatible with and based on the approved operating system.
2. Password-protected operator login and access; three levels, minimum.
3. Password-protected setup functions.
4. Context-sensitive online help.
5. Capability of creating, deleting, and copying files; and automatically maintaining a directory of all files, including size and location of each sequential and random-ordered record.

B. Data Formats:

1. User-programmable export and import of data to and from commonly used Microsoft Windows spreadsheet, database, billing, and other applications; using dynamic data exchange technology.
2. Option to convert reports and graphics to HTML format.
3. Interactive graphics.
4. Option to send preprogrammed or operator designed e-mail reports.

C. Metered Data: Display metered values in real time.

D. User-Defined Monitoring and Control Events: Display and record with date and time stamps accurate to 0.1 second, and including the following:

1. Operator log on/off.
2. Attempted operator log on/off.
3. All alarms.
4. Equipment operation counters.
5. Out-of-limit, pickup, trip, and no-response events.

E. Trending Reports: Display data acquired in real-time from different meters or devices, in historical format over user-defined time; unlimited as to interval, duration, or quantity of trends.

1. Spreadsheet functions of sum, delta, percent, average, mean, standard deviation, and related functions applied to recorded data.
2. Charting, statistical, and display functions of standard Windows-based spreadsheet.

F. Alarms: Display and record alarm messages from discrete input and controls outputs, according to user programmable protocol.

1. Functions requiring user acknowledgment shall run in background during computer use for other applications and override other presentations when they occur.

G. Display Monitor:

1. Backlighted LCD to display metered data with touch-screen selecting device.
2. Touch-screen display shall be a minimum 12-inch diagonal, resolution of 800 by 600 RGB pixels, 256 colors; NEMA 250, Type 1 display enclosure.
3. Display four values on one screen at same time.

2.6 POWER MONITORS

A. Separately mounted, permanently installed instrument for power monitoring and control, complying with UL 1244.

1. Enclosure: NEMA 250, Type 1.

B. Environmental Conditions: System components shall be capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

C. rms Real-Time Measurements:

1. Current: Each phase, neutral, average of three phases, percent unbalance.
2. Voltage: Line-to-line each phase, line-to-line average of three phases, line-to-neutral each phase, line-to-neutral average of three phases, line-to-neutral percent unbalance.
3. Power: Per phase and three-phase total.
4. Reactive Power: Per phase and three-phase total.
5. Apparent Power: Per phase and three-phase total.
6. Power Factor: Per phase and three-phase total.
7. Displacement Power Factor: Per phase and three-phase total.

8. Frequency.
9. THD: Current and voltage.
10. Accumulated Energy: Real kWh, reactive kVARh, apparent kVAh (signed/absolute).
11. Incremental Energy: Real kWh, reactive kVARh, apparent kVAh (signed/absolute).
12. Conditional Energy: Real kWh, reactive kVARh, apparent kVAh (signed/absolute).

D. Demand Current Calculations, per Phase, Three-Phase Average and Neutral:

1. Present.
2. Running average.
3. Last completed interval.
4. Peak.

E. Demand Real Power Calculations, Three-Phase Total:

1. Present.
2. Running average.
3. Last completed interval.
4. Predicted.
5. Peak.
6. Coincident with peak kVA demand.
7. Coincident with kVAR demand.

F. Demand Reactive Power Calculations, Three-Phase Total:

1. Present.
2. Running average.
3. Last completed interval.
4. Predicted.
5. Peak.
6. Coincident with peak kVA demand.
7. Coincident with kVAR demand.

G. Demand Apparent Power Calculations, Three-Phase Total:

1. Present.
2. Running average.
3. Last completed interval.
4. Predicted.
5. Peak.
6. Coincident with peak kVA demand.
7. Coincident with kVAR demand.

H. Average Power Factor Calculations, Demand Coincident, Three-Phase Total:

1. Last completed interval.
2. Coincident with kW peak.
3. Coincident with kVAR peak.
4. Coincident with kVA peak.

I. Sampling:

1. Current and voltage shall be digitally sampled at a rate high enough to provide accuracy to 63rd harmonic of 60-Hz fundamental.
2. Power monitor shall provide continuous sampling at a rate of 128 samples per cycle on all voltage and current channels in the meter.

J. Minimum and Maximum Values: Record monthly minimum and maximum values, including date and time of record. For three-phase measurements, identify phase of recorded value. Record the following parameters:

1. Line-to-line voltage.
2. Line-to-neutral voltage.
3. Current per phase.
4. Line-to-line voltage unbalance.
5. Line-to-neutral voltage unbalance.
6. Power factor.
7. Displacement power factor.
8. Total power.
9. Total reactive power.
10. Total apparent power.
11. THD voltage L-L.
12. THD voltage L-N.
13. THD current.
14. Frequency.

K. Current and Voltage Ratings:

1. Designed for use with current inputs from standard instrument current transformers with 5-A secondary and shall have a metering range of 0-10 A.
2. Withstand ratings shall not be less than 15 A, continuous; 50 A, lasting over 10 seconds, no more frequently than once per hour; 500 A, lasting 1 second, no more frequently than once per hour.
3. Designed for use with voltage inputs from standard instrument potential transformers with a 120-V secondary.

L. Accuracy:

1. Power: Accurate to 0.25 percent of reading, plus 0.025 percent of full scale.
2. Voltage and Current: Accurate to 0.075 percent of reading, plus 0.025 percent of full scale.
3. Power Factor: Plus or minus 0.002, from 0.5 leading to 0.5 lagging.
4. Frequency: Plus or minus 0.01 Hz at 45 to 67 Hz.
5. For meters that are circuit-breaker accessories, metering accuracy at full-scale shall not be less than the following:
   a. Current: Plus or minus 2.5 percent.
6. Voltage: Plus or minus 1.5 percent.
7. Energy, Demand, and Power: Plus or minus 4.0 percent.
8. Frequency: Plus or minus 1 Hz.

M. Alarms.

1. User Options:
   a. Define pickup, dropout, and delay.

2. Assign one of four severity levels to make it easier for user to respond to the most important events first.
3. Allow for combining up to four alarms using Boolean-type logic statements for outputting a single alarm.
4. Alarm Events:
   a. Over/undercurrent.

5. Over/undervoltage.
6. Current imbalance.
7. Phase loss, current.
8. Phase loss, voltage.
9. Voltage imbalance.
10. Over kW demand.
11. Phase reversal.
12. Digital input off/on.
13. End of incremental energy interval.
14. End of demand interval.

N. Control Power: 90- to 457-V ac or 100- to 300-V dc.

O. Communications:

1. Local plug-in connections shall be for RS-232 and 100 Base-T Ethernet.

P. Display Monitor:

1. Backlighted LCD to display metered data with touch-screen selecting device.
2. Touch-screen display shall be a minimum 12-inch diagonal, resolution of 800 by 600 RGB pixels, 256 colors; NEMA 250, Type 1 display enclosure.
3. Display four values on one screen at same time.
   a. Current, per phase rms, three-phase average.

4. Voltage, phase to phase, phase to neutral, and three-phase averages of phase to phase and phase to neutral.
5. Real power, per phase and three-phase total.
6. Reactive power, per phase and three-phase total.
7. Apparent power, per phase and three-phase total.
8. Power factor, per phase and three-phase total.
9. Frequency.
10. Demand current, per phase and three-phase average.
11. Demand real power, three-phase total.
12. Demand apparent power, three-phase total.
13. Accumulated energy (MWh and MVARh).
14. THD, current and voltage, per phase.
15. Reset: Allow reset of the following parameters at the display:
   a. Peak demand current.

16. Peak demand power (kW) and peak demand apparent power (kVA).

17. Energy (MWh) and reactive energy (MVARh).

2.7 LOW-VOLTAGE WIRING

A. Comply with Section 260523 "Control-Voltage Electrical Power Cables."

B. Low-Voltage Control Cable: Multiple conductor, color-coded, No. 20 AWG copper, minimum.

1. Sheath: PVC; except in plenum-type spaces, use sheath listed for plenums.
2. Ordinary Switching Circuits: Three conductors unless otherwise indicated.
3. Switching Circuits with Pilot Lights or Locator Feature: Five conductors unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CABLING

A. Comply with NECA 1.

B. Install cables and wiring according to requirements in Section 271500 "Communications Horizontal Cabling."

C. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

D. Install cables without damaging conductors, shield, or jacket.

3.3 IDENTIFICATION

A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."

B. Label each power monitoring and control module with a unique designation.

3.4 GROUNDING

A. Comply with IEEE 1100, "Recommended Practice for Powering and Grounding Electronic Equipment."

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Electrical Tests: Use caution when testing devices containing solid-state components.
2. Continuity tests of circuits.
3. Operational Tests: Set and operate controls at workstation and at monitored and controlled devices to demonstrate their functions and capabilities. Use a methodical sequence that cues and reproduces actual operating functions as recommended by manufacturer. Submit sequences for approval. Note response to each test command and operation. Note time intervals between initiation of alarm conditions and registration of alarms at central-processing workstation.
   a. Coordinate testing required by this Section with that required by Sections specifying equipment being monitored and controlled.
4. Verify accuracy of graphic screens and icons.
5. Metering Test: Load feeders, measure loads on feeder conductor with an rms reading clamp-on ammeter, and simultaneously read indicated current on the same phase at central-processing workstation. Record and compare values measured at the two locations. Resolve discrepancies greater than 5 percent and record resolution method and results.
6. Record metered values, control settings, operations, cues, time intervals, and functional observations and submit test reports printed by workstation printer.

C. Power monitoring and control equipment will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.

F. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.

G. Reports: Written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.

H. Remove and replace malfunctioning devices and circuits and retest as specified above.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain systems. See Section 017900 "Demonstration and Training."

1. Train Owner's management and maintenance personnel in interpreting and using monitoring displays and in configuring and using software and reports. Include

troubleshooting, servicing, adjusting, and maintaining equipment. Provide a minimum of 12 hours' training.

2. Training Aid: Use approved final versions of software and maintenance manuals as training aids.

END OF SECTION 260913

SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Photoelectric switches.
2. Standalone daylight-harvesting switching and dimming controls.
3. Indoor occupancy and vacancy sensors.
4. Switchbox-mounted occupancy sensors.
5. Digital timer light switches.

B. Related Requirements:

1. Section 262726 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Show installation details for the following:
   a. Occupancy sensors.
   b. Vacancy sensors.

2. Interconnection diagrams showing field-installed wiring.
3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's warranties.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

B. Energy Efficient Rebate Forms: Provide all documentation necessary to assist the airport with the submittal of new construction/major renovation incentives with Rocky Mountain Power – Wattsmart program. This includes, but is not limited to:

1. Product Invoices
2. Labor Breakdowns

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Faulty operation of lighting control devices.

2. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OUTDOOR PHOTOELECTRIC SWITCHES, LOW VOLTAGE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Industries, Inc.
2. Intermatic, Inc.
3. Leviton Manufacturing Co., Inc.

B. Description: Solid state; one set of NO dry contacts rated for 24 V ac at 1 A, to operate connected load, complying with UL 773, and compatible with lighting relay panel.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range.
3. Time Delay: Thirty-second minimum, to prevent false operation.
4. Mounting: 1/2-inch threaded male conduit.
5. Failure Mode: Luminaires stay ON.

2.2 DAYLIGHT-HARVESTING DIMMING CONTROLS, DIGITAL

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Industries, Inc.
2. Hubbell Building Automation, Inc.
3. Leviton Manufacturing Co., Inc.
4. Lithonia Lighting; Acuity Brands Lighting, Inc.

5. WattStopper; a Legrand® Group brand.

B. Description: Sensing daylight and electrical lighting levels, the system adjusts the indoor electrical lighting levels. As daylight increases, lights are dimmed.

1. Lighting control set point is based on the following two lighting conditions:
   a. When no daylight is present (target level).
   b. When significant daylight is present.

2. System programming is done with two hand-held, remote-control tools.
   a. Initial setup tool.
   b. Tool for occupants to adjust the target levels by increasing the set point up to 25 percent, or by minimizing the electric lighting level.

C. Ceiling-Mounted Dimming Controls: Solid-state, light-level sensor unit, with separate power pack, to detect changes in indoor lighting levels that are perceived by the eye.

D. Electrical Components, Devices, and Accessories:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Sensor Output: 0- to 10-V dc to operate luminaires. Sensor is powered by controller unit.
3. Light-Level Sensor Set-Point Adjustment Range: 20 to 60 fc.

E. Power Pack: Digital controller capable of accepting three RJ45 inputs with one output(s) rated for 20-A LED load at 120- and 277-V ac, f. Sensor has 24-V dc Class 2 power source, as defined by NFPA 70.

1. Compatible with digital addressable lighting interface.
2. Plenum rated.

2.3 INDOOR OCCUPANCY AND VACANCY SENSORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Building Automation, Inc.
2. Leviton Manufacturing Co., Inc.
3. Sensor Switch, Inc.
4. WattStopper; a Legrand® Group brand.

B. General Requirements for Sensors:

1. Separate power pack.
2. Hardwired connection to switch.
3. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
4. Operation:

a. Occupancy Sensor: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
b. Vacancy Sensor: Unless otherwise indicated, lights are manually turned on and sensor turns lights off when the room is unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
c. Combination Sensor: Unless otherwise indicated, sensor shall be programmed to turn lights on when coverage area is occupied and turn them off when unoccupied, or to turn off lights that have been manually turned on; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.

5. Sensor Output: Sensor is powered from the power pack.
6. Power: Line voltage.
7. Power Pack: Dry contacts rated for 20-A LED load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.
8. Mounting:
   a. Sensor: Suitable for mounting in any position on a standard outlet box.
   b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
   c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
9. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
10. Bypass Switch: Override the "on" function in case of sensor failure.
11. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; turn lights off when selected lighting level is present.

C. Dual-Technology Type: Wall or Ceiling mounted, as scheduled on drawings; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.

1. Sensitivity Adjustment: Separate for each sensing technology.
2. Detector Sensitivity: Detect occurrences of 6 inch minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
3. Detection Coverage: Per schedule on sheet E-601.

2.4 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

A. General Requirements for Sensors: Automatic-wall-switch occupancy sensor with manual on-off switch, suitable for mounting in a single gang switchbox using hardwired connection.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2. Occupancy Sensor Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn lights off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
3. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
4. Switch Rating: Not less than 800-VA LED load at 120 V, 1200-VA.

B. Wall-Switch Sensor:

1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area as indicated on schedule on sheet E-601.
2. Sensing Technology: Dual technology - PIR and ultrasonic.
3. Switch Type: SP, field-selectable automatic "on," or manual "on," automatic "off."
4. Capable of controlling load in three-way application.
5. Voltage: 120 V.
6. Ambient-Light Override: Concealed, field-adjustable, light-level sensor from 10 to 150 fc. The switch prevents the lights from turning on when the light level is higher than the set point of the sensor.
7. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
8. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.
9. Color: White.
10. Faceplate: Color matched to switch.

2.5 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 24 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.

B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

A. Comply with NECA 1.

B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

C. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 WIRING INSTALLATION

A. Comply with NECA 1.

B. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch.

C. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.

E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.4 IDENTIFICATION

A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."

1. Identify controlled circuits in lighting contactors.
2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

B. Label time switches and contactors with a unique designation.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Lighting control devices will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 260923

SECTION 260943 - DISTRIBUTED LIGHTING CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

1.2 Provide Distributed Digital Lighting Controls (controls) as indicated on the drawings and as specified herein. The controls shall consist of a series of standalone digital load controllers and intelligent low-voltage devices dedicated to the room/space they are serving. All local devices shall be connected together via an In-Room Network, enabling digital communication between devices. Digital Lighting Control Panels, where indicated on the drawings, may also be used for lighting control as part of the overall lighting control scheme. Section Includes: Lighting control panels using mechanically held relays for switching.

A. The system architecture shall connect multiple In-Room local networks for centralized building-wide monitoring and management via a Global Network and PC-based software. Refer to the drawings for which rooms/spaces are to be connected to the Global Network. The system architecture shall allow standalone digital load controllers and associated devices to function in some default capacity, even if network connectivity to the Global Network is lost.

B. The controls shall provide time-based, sensor-based (e.g. occupancy/vacancy and daylight sensors), and/or manual control as indicated in the lighting sequences of operation on the drawings.

1.3 RELATED SECTIONS

A. Section 265119 “LED Interior Lighting”.

1.4 REFERENCE STANDARDS

A. NFPA 70-National Electrical Code; National Fire Protection Association

B. NEMA-National Electrical Manufacturers Association

C. FCC -Federal Communications Commission – Emission Standards

D. UL-Underwriters Laboratories, Inc. Listings

E. UL 2043-Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products Installed in Air-Handling Spaces

F. UL 20-General-Use Snap Switches, Plug Load Controls

G. UL 508 -Standard for Industrial Control Equipment

H. UL 916 -Standard for Energy Management Equipment

I. UL 924 -Standard for Emergency Lighting and Power Equipment

1.5 DESIGN/PERFORMANCE REQUIREMENTS

A. Distributed Digital Lighting Controls shall accommodate the square-footage coverage requirements for each area controlled utilizing digital load controllers, digital occupancy/vacancy sensors, digital daylighting sensors, digital switches, digital lighting control panels, and accessories that suit the required lighting and electrical system parameters.

B. System shall conform to requirements of NFPA 70.

C. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.

D. System shall be listed under UL sections 916 and/or 508.

1.6 DEFINITIONS

A. BAS: Building automation system

B. DDC: Direct digital control.

C. IP: Internet protocol.

D. Monitoring: Acquisition, processing, communication, and display of equipment status data, metered electrical parameter values, power quality evaluation data, event and alarm signals, tabulated reports, and event logs.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for control modules, power distribution components, relays, manual switches and plates, and conductors and cables.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
3. Sound data including results of operational tests of central dimming controls.
4. Operational documentation for software and firmware.

B. Occupancy Sensor Shop Drawings

1. Symbols on drawings are diagrammatic and represents design intent. Provide manufacturer-recommended layout drawings showing quantity and locations of sensors and associated wiring diagrams.

1.8 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Submit evidence that lighting controls are compatible with connected monitoring and control devices

1. Show interconnecting signal and control wiring, and interface devices that prove compatibility of inputs and outputs.
2. For networked controls, list network protocols and provide statements from manufacturers that input, and output devices comply with interoperability requirements of the network protocol.

B. Qualification Data: For testing agency.

C. Field quality-control reports.

D. Software licenses and upgrades required by and installed for operation and programming of digital and analog devices.

E. Sample Warranty: For manufacturer's special warranty.

1.9 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For lighting controls to include in emergency, operation, and maintenance manuals.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On USB drive.
3. Device address list.
4. Printout of software application and graphic screens.
5. Testing and adjusting of panic and emergency power features.

1.10 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. One (1) ON/OFF Load Controller with three relays
2. One (1) ON/OFF/Dimming Load Controller with three relays
3. One (1) of each type of motion sensor used
4. One (1) daylight sensor
5. One (1) two-button digital wall switch

1.11 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

B. Example Contractor Startup/Commissioning Worksheet – must be completed prior to factory start-up

C. IBC 1708.5 Electrical equipment. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional in responsible charge of the design of the designated seismic system and for approval by the building official. The evidence of compliance shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety. The special inspector shall examine the designated seismic system and determine whether the anchorages and label conform with the evidence of compliance.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Handle and prepare panels for installation according to NECA 407.

1.13 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of standalone multipreset modular dimming controls that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Damage from transient voltage surges.

2. Warranty Period: Cost to repair or replace any parts for two years from date of Substantial Completion.
3. Extended Warranty Period: Cost of replacement parts (materials only, f.o.b. the nearest shipping point to Project site), for eight years, that failed in service due to transient voltage surges.

PART 2 - PRODUCTS

2.1 SYSTEM REQUIREMENTS

A. Lighting control zones shall consist of one or more intelligent lighting control components (digital load controllers), be capable of stand-alone operation, and be capable of being connected to a higher-level network backbone.

B. Network Characteristics

1. In-Room Network:
   a. The In-Room network shall be a free topology lighting control network using physical wiring connections and communication protocol designed to control a room/space/small area of a building.

b. Digital room devices connect to the In-Room network, which provides both communications and power to room devices.

2. Global Network (In-Room to In-Room Network):
   a. The Global network shall be a linear topology network to connect In-Room networks and relay panels (if applicable) for centralized control.
   b. Each In-Room Network to be connected to the Global Network shall include a single network bridge, and the network bridge is the only room-based device that is connected to the Global Network.
   c. The Global Network shall utilize communications cabling as specified by the manufacturer. The maximum cable run for each segment (distance between In-Room Networks) shall meet manufacturer limitations.

3. Individual lighting zones must continue to provide a user defined default level of lighting control in the event of a system communication failure with the Global Network or the management software becoming unavailable.
4. All switching and dimming for a specific lighting zone shall take place within the devices located in the zone itself (i.e. not in remotely located devices such as panels) to facilitate system robustness and minimize wiring requirements. Specific applications that require centralized or remote switching shall be capable of being accommodated.
5. System shall be capable of using a web-based software management program that enables remote system control, status monitoring, and creation of lighting control schedules and profiles.

2.2 DIGITAL LOAD CONTROLLERS (ROOM CONTROLLERS)

A. General

1. Digital load controllers shall be simple to install and shall not have dip switches or potentiometers or require special configuration.
2. The controllers shall include the following features:
   a. Standard junction box mounting.
   b. Low voltage connection using standard RJ-45 connectors and CAT5e cable. Other wiring topologies are acceptable if controls accomplish all requirements specified in these documents.
   c. Each connected load shall be capable of any of the following behaviors: Manual ON, Automatic ON, Automatic ON to 50 percent, or Automatic ON to Preset level or last level set.
   d. UL 2043 plenum rated.
   e. Manual override and LED indication for each load.
   f. Power supply to power the digital load controller itself and the peripheral sensors and controls connected to the In-Room Network.
   g. Dual voltage (120/277 VAC, 60 Hz), rated for 20A total load, derating to 16A required for some dimmed loads (forward phase dimming).
   h. Zero cross circuitry for each load.
   i. All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.

B. On/Off Load Controllers

1. Controllers shall include the following:
   a. Multiple relay configurations per unit.

C. ON/OFF/Dimming Load Controllers

1. Controllers shall include the following:
   a. Multiple relay configurations per unit.
   b. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected LED driver.
   c. One dimming output per relay.
      1) 0-10V Dimming: Where indicated, one 0-10 volt analog output per relay for control of compatible LED drivers. The 0-10 volt output shall automatically close upon loss of power to the Controller to assure full light output from the controlled lighting.
   d. Each load shall have an independently configurable preset ON level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events.

2.3 DIGITAL MOTION SENSORS

A. General

1. Sensors shall be available in wall, ceiling, corner-mounted, or wall-switch configurations.
2. Sensors shall use either passive infrared (PIR) sensing, or if dual technology, passive infrared and passive acoustic or passive infrared and ultrasonic sensing for detecting room occupancy.
3. Sensors shall be able to function together with other sensors in order to provide expanded coverage areas.

B. Features

1. Sensors shall be provided with the following features:
   a. Sensitivity Adjustment, Time Delay, Detection Technology, and Walk-Through Mode.
   b. Dual-Technology Sensors shall have independent configurable trigger modes to choose proper technology according to space use to eliminate false-triggers.
   c. Each sensor may be programmed to control specific loads within an In-Room network.
   d. Each sensor shall allow remote programming through a handheld commissioning tool via a two-way infrared (IR) transceiver or by configuration through a local network device.

C. Digital Wall Switch Motion Sensors

1. Digital wall switch motion sensors shall be provided with the following features:
   a. Shall not allow current to pass to the load when sensor is in the unoccupied (Off) condition.
   b. One- or two-button switches for one or two switch-legs.
   c. Optional daylight sensor feature for daylighting override.

2.4 DIGITAL DAYLIGHT SENSORS

A. Daylight sensors shall be provided with the following features:

1. Digital daylighting sensors shall work with room controllers to provide automatic switching, bi-level, tri-level, or dimming daylight harvesting capabilities for any load type connected to a room controller.
2. Daylighting sensors shall be interchangeable without the need for rewiring.
3. Sensor light level range shall be from 1-250 foot-candles (fc).
4. For switching daylight harvesting, the daylight sensor shall provide a field-selectable deadband (separation) between the "ON" setpoint and the "OFF" setpoint that will prevent the lights from cycling excessively after they turn OFF.
5. For dimming daylight harvesting, the daylight sensor shall provide the option, when the daylight contribution is sufficient, of turning lights OFF or dimming lights to a field-selectable minimum level.
6. Delay shall be incorporated into the photocell to prevent rapid response to passing clouds.
7. Daylight sensors shall have an independently configurable fade rate for both increasing and decreasing light level in units of percent-per-second.
8. Daylight Sensors shall provide adjustable cut-off time (0-120 minutes). Cut-off time is defined by the number of selected minutes the load is at the minimum output before the load turns off.
9. Optional wall switch override shall allow occupants to reduce lighting level to increase energy savings or, if permitted by system administrator, raise lighting levels for a selectable period of time or cycle of occupancy.
10. Each sensor shall allow remote programming through a handheld commissioning tool via a two-way infrared (IR) transceiver or by configuration through a local network device.

2.5 DIGITAL MANUAL CONTROLS

A. Wall Switches

1. Low voltage dimming and momentary pushbutton switches in 1, 2, 3, 4, 5, and 8 Button configurations.
2. Wall switches shall include the following features:
   a. Buttons may be programmed as Load or Scene Buttons.
   b. Buttons may be programmed as ON/OFF, ON only, or OFF only.
   c. Switch buttons may be bound to any load on a room controller and are not load type dependent.

B. Dimmer Switches

1. Raise/lower dimming adjustment controls.
2. Dimmer switches shall include multiple LEDS to indicate load levels.
3. Dimmer switches shall be able to be ganged with multi-button switches under the same device cover plate.
4. Three-way and 4-way switch locations are supported for ON/OFF or Dimming control.

2.6 DIGITAL LED LUMINAIRES

A. Digital LED luminaires are allowed, but not required.

B. Digital LED Luminaires are luminaires with embedded controls (a.k.a. “enabled” luminaires). Enabled luminaires to have a mechanically-integrated control device, allowing the luminaires to communicate digitally with other digital lighting controls. All lighting control devices and “enabled” luminaires within a controlled room/space shall be networked together, enabling digital communication between devices.

2.7 DIGITAL AUXILIARY INPUT/OUTPUT (I/O) INTERFACE MODULES

A. General

1. Operate on Class 2 power supplied by In-Room network.
2. Status LEDs indicate if input is energized.
3. UL 2043 plenum rated where required.

B. Switched Contact Closure Interface

1. Utilized for automatic control via input from other sources such as switches, relay-based system, BAS, etc.
2. Includes 24VDC output and input terminals for momentary or maintained third party contact closure inputs.
3. Utilize input module for an Auto ON and Sweep OFF function input from other sources for the controlled area. During normal hours of operation, all local low-voltage devices are fully operational. During after hours, a timer shall be applied to all low-voltage switches or dimmers so that the room will automatically sweep off every two hours following switch activation. Provide a blink warning to alert occupants of impending OFF.
4. Specific I/O devices shall have a dimming control output that can control 0-10 VDC dimmable ballasts or LED drivers by sinking up to 20 mA of current.
5. Specific I/O devices shall have an input that reads a 0-10 VDC signal from an external device.
6. Specific I/O devices shall have a switch input that can interface with either a maintained or momentary switch and run a switch event (e.g. toggle the lighting load) or run a local/remote control profile.
7. Specific I/O devices shall sense state of low-voltage outdoor photocells.
8. Specific I/O devices shall sense momentary and maintained contact closures, and either toggle a connected load after a momentary contact or ramp the load high/low during a maintained contact (stopping when the contact releases).

C. Serial Data Interface

1. Utilized for control from A/V system to send ON/OFF/Preset commands to In-Room Network.
2. Includes 24VDC output and 10 pin RS232 connection.
3. Coordinate programming with the Distributed Digital Lighting Control System manufacturer’s technician and the A/V system technician for successful interface between both systems.

2.8 CONFIGURATION TOOLS

A. A configuration tool facilitates optional customization of In-Room networks.

1. Provide two Configuration Tools for the project.
2. Provide free, downloadable PC software for direct programming of In-Room Networks.

B. Features and functionality of the wireless configuration tool shall include but not be limited to:

1. Optional customization of In-Room networks using two-way wireless communications or USB interface.
2. Must be able to read and modify parameters for room controllers, occupancy sensors, wall switches, daylighting sensors, network bridges and relay panels, and identify room devices by type and serial number.
3. Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls.

2.9 NETWORK CABLES

A. In-Room Networks

1. This specification is based on CAT5e data cables for In-Room Networks. Other wiring topologies are acceptable if controls accomplish all requirements specified in these documents.
2. Use manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors for In-Room Networks. If manufacturer’s cables are not used, each field-terminated cable shall be tested prior to installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
3. UL 2043 plenum rated where required.

B. Global Network

1. The Global Network, where used, shall utilize communications cabling as specified by the manufacturer. The maximum cable run for each segment (distance between In-Room Networks) shall meet manufacturer limitations.

C. Class 2 0-10V Control Circuits Installed with Class 1 Conductors: Indoors - Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway. Outdoors - Type XHHW-2, complying with UL 44 in raceway.

2.10 NETWORK INTERFACES

A. Global Network Bridge:

1. Provide one bridge for each In-Room Network that is to be connected to the Global Network.
2. UL 2043 plenum rated where required.
3. Manufacturer-specified network cable shall daisy-chain all network bridges together.

4. The Global Network Bridge module connects an In-Room Network to a segment of the Global Network for communication between rooms, relay panels, and a Global Management Controller or BAS.
5. The Global Network Bridge shall be provided as a separate module connected on the In-Room network.
6. Global Network Bridge shall make all room devices connected to the In-Room network and all device parameters visible to the Global Management Controller via the Global Network.
7. The global network bridge shall link back to front-end controller for connection to building LAN for centralized programming and BAS interface (optional).
8. If a network bridge loses communication with the Global Network, In-room network shall stay active and operate as normally programmed. There shall be no disruption to local control.

B. Management Software

1. Every device parameter (e.g. sensor time delay and photocell setpoint) shall be available and configurable remotely from the software.
2. Software shall require all users to log in with a User Name and Password.
3. Software shall provide at least three permission levels for users.
4. All sensitive stored information and privileged communication by the software shall be encrypted.
5. All device firmware and system software updates must be available for automatic download and installation via the internet.
6. Software shall be capable of managing systems interconnected via a WAN (wide area network).]

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

3.2 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not install equipment until following conditions can be maintained in spaces to receive equipment:

1. Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).
2. Relative humidity: Maximum 90 percent, non-condensing.

3.3 SENSOR LAYOUTS

A. Confirm quantity and provide appropriate coverage by sensors on a per-space requirement. Symbols on drawings are diagrammatic and represent design intent only.

B. Occupancy sensors shall be installed at locations indicated on the manufacturer's submittal layout drawings. Sensors shall be located to prevent false triggering of the lights to ON when no occupant is present.

C. Daylight sensors shall be installed at locations indicated on the manufacturer's submittal layout drawings per best design practice for the sensor.

3.4 INSTALLATION

A. Install system in accordance with the approved system shop drawings and manufacturer's instructions.

B. Install all room/space devices using manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors.

1. If pre-terminated cable is not used for room/space wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
2. Install all room-to-room digital devices using manufacturer-supplied network wire. Network wire substitution is not permitted and may result in loss of product warranty.
3. Low-voltage wiring topology must comply with manufacturer's specifications.
4. Document final wiring locations, routing, and topology on as-built drawings.

C. All line-voltage connections shall be tagged to indicate circuit and switched legs.

D. Test all devices to ensure proper communication.

E. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings.

F. Adjust time delay so that controlled area remains lighted while occupied.

G. Provide written or computer-generated documentation on the configuration of the system including room-by-room description including:

1. Sensor parameters, time delays, sensitivities, and daylighting setpoints.
2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
3. Load Parameters (e.g. blink warning, etc.)

H. Tighten all panel Class I conductors at circuit breakers and at loads to torque ratings as marked on enclosure UL label.

I. All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.

J. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimmed loads shall have separate neutrals.

K. Verify all loads to be free from short circuits prior to connection to room controllers.

3.5 FIELD QUALITY CONTROL

A. Electrician/Low Voltage Technician: Any low voltage wiring made onsite by electrical or low voltage contractor must be verified end to end with industry standard test equipment capable of printing or producing a digital file of the testing results.

B. Tests and Inspections: Manufacturer's service representative or electrical/low-voltage contractor installing low voltage cabling that is not pre-terminated from the manufacturer shall perform the following inspections and prepare reports:

C. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports:

1. Verify end-to-end testing of all low voltage wiring that is not pre-terminated from the manufacturer. Provide detailed results via paper or digital format downloadable from testing equipment.
2. Verify Class I and II wiring connections by validating system performance.
3. Set IP addresses and other network settings of system front-end hardware per facility’s IT. instructions.
4. Verify/complete task programming for all switches, dimmers, time clocks, and sensors.
5. Verify that the control of each space complies with the Lighting Sequence of Operation.
6. Correct any system issues and retest.

3.6 POST START-UP TUNING

A. Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from initial occupancy. Provide a detailed report to the Architect/Owner of post start-up activity.

3.7 WARRANTY

A. Manufacturer shall provide a 5-year limited warranty on products within this installation, except where otherwise noted, and consisting of a one-for-one device replacement.

3.8 PRODUCT SUPPORT AND SERVICE

A. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

3.9 AGENCY TRAINING

A. All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 017800 "Closeout Submittals".

B. The Contractor, through their supplier, shall provide training on the system operation for the owner as part of this contract. The training shall consist of two (2) four-hour sessions.

3.10 CYBERSECURITY RISK MITIGATION

A. Coordinate with Owner's IT Department to restrict external network access to Internet connected system through virtual private network (VPN) connections only.

B. Disable any protocols for remote connectivity, unless constantly required for day-to-day operations.

C. All external transport data shall be routed through encrypted channels with 2048-bit secure sockets layer (SSL).

D. Coordinate with Owner's IT Department to implement a Web server-based human machine interface (HMI) that relies on IT technologies to secure access and restrict ports that can be opened on the firewall. Coordinate with Owner's IT Department to restrict access to known IP addresses only.

E. Where building system networks are not physically separate from IT business networks, coordinate with Owner's IT Department to segregate networked and Internet connected systems from the IT business network using virtual local area network (VLAN) IT technologies to restrict internal attacks/breakdowns.

F. Set unique, cryptographically strong passwords for administrator and user accounts. Default passwords must be changed before systems are connected to the Owner's network.

G. Collect only the data that is necessary for analytics and optimization.

H. References:

1. NIST Special Publication 800-14 – Generally Accepted Principles and Practices for Securing Information Technology Systems.
2. NIST Special Publication 800-54 Revisions 4 – Security and Privacy Controls for Federal Information Systems and Organizations.
3. Defense Security Service Office of the Designated Approving Authority – Master System Security Plan (MSSP) Template for Peer-to-Peer Networks (June 2011, Version 3.0).
4. IEC 62443: Industrial Network and System Security

END OF SECTION 260943

SECTION 262213 - LOW-VOLTAGE DISTRIBUTION TRANSFORMERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes distribution, dry-type transformers with a nominal primary and secondary rating of 600 V and less, with capacities up to 1500 kVA.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components, and profiles, and finishes for each type and size of transformer.
2. Include rated nameplate data voltage, KVA, impedance ratings and characteristics, loss data, efficiency at 25, 50, 75, and 100 percent rated load, sound level, tap configurations, insulation system type, rated temperature rise.

B. Shop Drawings:

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Seismic Qualification Data: Certificates, for transformers, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
4. Certification: Indicate that equipment meets Project seismic requirements.

C. Source quality-control reports.

D. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inspection: On receipt, inspect for and note any shipping damage to packaging and transformer.

1. If manufacturer packaging is removed for inspection, and transformer will be stored after inspection, re-package transformer using original or new packaging materials that provide protection equivalent to manufacturer's packaging.

B. Storage: Store in a warm, dry, and temperature-stable location in original shipping packaging.

C. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

D. Handling: Follow manufacturer's instructions for lifting and transporting transformers.

PART 2 - PRODUCTS

END OF SECTION 262213

SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Lighting and appliance branch-circuit panelboards.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of panelboard.

1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details.
2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
4. Detail bus configuration, current, and voltage ratings.
5. Short-circuit current rating of panelboards and overcurrent protective devices.
6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
7. Component List.
8. Cable terminal sizes.
9. Break layout drawings with dimensions indicated and nameplate designations.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Seismic Qualification Data: Certificates, for panelboards, overcurrent protective devices, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. Refer to Division 1 “Operation and Maintenance Data” for additional requirements.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.
2. Circuit Breakers: As indicated in panel schedules

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Handle and prepare panelboards for installation according to NEMA PB 1.

1.9 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
   a. Ambient Temperature: Not exceeding minus 22 deg F to plus 104 deg F.
   b. Altitude: Not exceeding 6600 feet.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.

1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 260548.16 "Seismic Controls for Electrical Systems."

2.2 If specific size equipment is required due to space limitations, note this on the drawings.

A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

E. Enclosures: Flush or Surface-mounted (as indicated on Panel Schedules), dead-front cabinets.

1. Height: 84 inches maximum.
2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
4. Finishes:
   a. Panels and Trim: Steel and galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
   b. Back Boxes: Galvanized steel.

F. Incoming Mains: Contractor to Determine Location

G. Phase, Neutral, and Ground Buses:

1. Material: Tin-plated aluminum.
   a. Plating shall run entire length of bus.
   b. Bus shall be fully rated the entire length.

2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

H. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Terminations shall allow use of 75 deg C rated conductors without derating.
3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.

I. Future Devices: Panelboards or load centers shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

1. Percentage of Future Space Capacity: 20 percent unless noted otherwise on drawings

J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.

1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Eaton.
   a. ABB Industrial Solutions.

b. Siemens Industry, Inc., Energy Management Division.
c. Square D; by Schneider Electric.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Refer to Panel Schedules.

D. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

F. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

2.5 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers:
   a. Inverse time-current element for low-level overloads.
   b. Instantaneous magnetic trip element for short circuits.
   c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. MCCB Features and Accessories:
   a. Standard frame sizes, trip ratings, and number of poles.
   b. Breaker handle indicates tripped status.
   c. UL listed for reverse connection without restrictive line or load ratings.
   d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
   e. Rating Plugs: Three-pole breakers with ampere ratings greater than 150 amperes shall have interchangeable rating plugs or electronic adjustable trip units.
   f. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
   g. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.6 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.

C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.

1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.

B. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.

C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.

D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Comply with NECA 1.

C. Install panelboards and accessories according to NEMA PB 1.1.

D. Equipment Mounting:

3.3 Coordinate with structural engineer if Structural Documents indicate concrete equipment pad requirements. If concrete equipment pads are provided by Electrical Contractor, keep second option below and coordinate with Division 3.

A. Attach panelboard to the vertical finished or structural surface behind the panelboard.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

C. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."

D. Mount top of panelboard so that the top-most switch or circuit breaker is not higher than 78” (6’ – 6”) above finished floor or grade.

E. Mount panelboard cabinet plumb and rigid without distortion of box.

F. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable, circuit-breaker trip ranges.
2. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written instructions.

G. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.

H. Install filler plates in unused spaces.

I. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.4 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

E. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers and low-voltage surge arrestors stated in NETA ATS, Paragraph 7.6 Circuit Breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Panelboards will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies panelboards included. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes. Prior to making circuit changes to achieve load balancing, inform Architect of effect on phase color coding.

1. Measure loads during period of normal facility operations.
2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Architect. Avoid disrupting services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20 percent.

3.7 PROTECTION

A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION 262416

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard-grade receptacles, 125 V, 20 A.
2. USB receptacles.
3. GFCI receptacles, 125 V, 20 A.
4. Twist-locking receptacles.
5. Pendant cord-connector devices.
6. Cord and plug sets.
7. Toggle switches, 120/277 V, 20 A.
8. Digital timer light switches.
9. Wall plates.
10. Floor Boxes.
11. Poke-through assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with requirements in this Section.

F. Devices for Owner-Furnished Equipment:

1. Receptacles: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

G. Device Color:

1. Wiring Devices Connected to Normal Power System:
   a. All devices located within wood finishes shall be black. All other areas shall be white, unless otherwise indicated.

2. Devices that are shaded on the drawings shall be: Red.

H. Wall Plate Color: For plastic covers, match device color.

I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Hubbell Incorporated; Wiring Device-Kellems Hubbell Pro Series 5352.
2. Leviton Manufacturing Co., Inc-M5362.
3. Pass & Seymour/Legrand (Pass & Seymour)- 5352 Series.

B. Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

C. Isolated-Ground Duplex Receptacles, 125 V, 20 A:

1. Description: Straight blade; equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts. Two pole, three wire, and self-grounding.

2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

D. Plug Load Controlled Duplex Receptacle: 125V, 20A, comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

E. Tamper-Resistant Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

F. Weather-Resistant Duplex Receptacle, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

G. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.3 USB RECEPTACLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Incorporated; Wiring Device-Kellems.
2. Leviton Manufacturing Co., Inc.
3. Pass & Seymour/Legrand (Pass & Seymour).

B. Tamper-Resistant Duplex and USB Charging Receptacles:

1. Description: Single piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Integral shutters that operate only when a plug is inserted in the line voltage receptacle.
2. Line Voltage Receptacles: Two pole, three wire, and self-grounding; NEMA WD 6, Configuration 5-20R.
3. USB Receptacles: Dual USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).

4. Standards: Comply with UL 498, UL 1310, USB 3.0 devices, and FS W-C-596.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

2.4 GFCI RECEPTACLES, 125 V, 20 A

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Incorporated; Wiring Device-Kellems-GF20L.
2. Leviton Manufacturing Co., Inc-GFNT2.
3. Pass & Seymour/Legrand (Pass & Seymour)-2097.

B. Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

C. Tamper-Resistant Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

D. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498 and UL 943 Class A.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.5 TWIST-LOCKING RECEPTACLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Hubbell Incorporated; Wiring Device-Kellems.

2. Leviton Manufacturing Co., Inc.
3. Pass & Seymour/Legrand (Pass & Seymour).

B. Twist-Lock, Single Receptacles, 120 V, 20 A:

1. Configuration: NEMA WD 6, Configuration L5-20R.
2. Standards: Comply with UL 498.

C. Twist-Lock, Single Receptacles, 250 V, 20 A:

1. Configuration: NEMA WD 6, Configuration L6-20R.
2. Standards: Comply with UL 498.

D. Twist-Lock, Isolated-Ground, Single Receptacles, 125 V, 20 A:

1. Grounding: Equipment grounding contacts shall be connected only to green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
2. Configuration: NEMA WD 6, Configuration L5-20R.
3. Standards: Comply with UL 498.

2.6 PENDANT CORD-CONNECTOR DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Hubbell Premise Wiring.
2. Leviton Manufacturing Co., Inc.
3. Pass & Seymour/Legrand (Pass & Seymour).

B. Description: Matching, locking-type plug and receptacle body connector, heavy-duty grade.

C. Configuration: As indicated on drawings.

D. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.

E. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

F. Standards: Comply with FS W-C-596.

2.7 CORD AND PLUG SETS

A. Match voltage and current ratings and number of conductors to requirements of equipment being connected.

B. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.

C. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.8 TOGGLE SWITCHES, 120/277 V, 20 A

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Hubbell Premise Wiring.
2. Leviton Manufacturing Co., Inc.
3. Pass & Seymour/Legrand (Pass & Seymour).

B. Single-Pole Switches, 120/277 V, 20 A:

1. Standards: Comply with UL 20 and FS W-S-896.

C. Three-Way Switches, 120/277 V, 20 A:

1. Comply with UL 20 and FS W-S-896.

D. Four-Way Switches, 120/277 V, 20 A:

1. Standards: Comply with UL 20 and FS W-S-896.

E. Pilot-Light, Single-Pole Switches: 120/277 V, 20 A:

1. Description: Illuminated when switch is off.
2. Standards: Comply with UL 20 and FS W-S-896.

2.9 TIMER LIGHT SWITCH

A. Digital Timer Light Switch:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
   a. Hubbell Incorporated; Wiring Device-Kellems.
   b. Sensor Switch
   c. Leviton Manufacturing Co., Inc.

2. Description: Switchbox-mounted, combination digital timer and conventional switch lighting-control unit, with backlit digital display, with selectable time interval in 10-minute increments.
3. Standards: Comply with UL 20.
4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.

2.10 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant thermoplastic with lockable cover.

2.11 FLOOR BOXES

A. Refer to Floor Box Schedule on Drawings for additional requirements.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Hubbell Premise Wiring.
2. Thomas & Betts Power Solutions; ABB Group.
3. Wiremold / Legrand.

C. Metal Floor Boxes:

1. Material: Cast metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.

D. Flush-Type Floor Service Fittings:

1. Description: Type: Modular, flush-type, dual-service units suitable for wiring method used, with cover flush with finished floor.
2. Compartments: Barrier separates power from voice and data communication cabling.
3. Service Plate and Cover: Rectangular, die-cast aluminum with satin finish.
4. Power Receptacle: NEMA WD 6 Configuration 5-20R.
5. Data Communication Outlet: Refer to Division 27 Specifications for Communication Outlet Requirements.

2.12 POKE-THROUGH ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. Hubbell Incorporated; Wiring Device-Kellems.
2. Pass & Seymour/Legrand (Pass & Seymour).
3. Wiremold / Legrand.

B. Description: Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.

C. Standards: Comply with scrub water exclusion requirements in UL 514.

D. Service-Outlet Assembly: Flush type with four simplex receptacles and space for four RJ-45 jacks, complying with communication outlet requirements in Division 27."

E. Size: Selected to fit nominal 4-inch cored holes in floor and matched to floor thickness.

F. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.

G. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables that comply with requirements in Section 271513 "Communications Copper Horizontal Cabling."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

B. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
   a. Cut back and pigtail or replace all damaged conductors.
   b. Straighten conductors that remain and remove corrosion and foreign matter.
   c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

C. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

D. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.

E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

G. Surface Raceways

1. Install surface raceway with a minimum 2-inch radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

3.2 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.

5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions remove malfunctioning units and replace with new ones, and retest as specified above.

B. Wiring device will be considered defective if it does not pass tests and inspections.

END OF SECTION 262726

SECTION 264113 - LIGHTNING PROTECTION FOR STRUCTURES

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

A. Installer: [UL-listed installer, category OWAY] [or] [LPI Master Installer].

1.2 PERFORMANCE REQUIREMENTS

A. Lightning Protection Standard: [**NFPA 780**] [**UL 96A**] for [**Class I**] [**Class II**] buildings.

B. Components: UL 96.

1.3 COMPONENTS

A. Roof-Mounting Air Terminals: [**Copper**] [**Stainless steel**] [**Aluminum**].

B. Ground Rods: [Solid copper] [Copper-clad steel] [Stainless steel].

C. Main Conductors: [**Class I**] [**Class II**].

1.4 INSTALLATION

A. Conductors to Be Concealed:

1. System conductors.
2. Down conductors.
3. Interior conductors.
4. Conductors within normal view of exterior locations at grade.

B. Ground loop.

C. Ground ring.

D. Lightning protection components bonded with intermediate-level interconnection loop conductors at 60-foot intervals.

1.5 FIELD QUALITY CONTROL

A. Inspection: [UL Master Label Certificate] [UL Letter of Findings Limited Scope Inspection Report] [LPI Master Certificate] [LPI Limited Scope Certification].

END OF SECTION 264113

SECTION 264313 – SURGE PROTECTION FOR LOW VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes field-mounted SPDs for low-voltage (120 to 600 V) power distribution and control equipment.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Copy of UL Category Code VZCA certification, as a minimum, listing the tested values for VPRs, Inominal ratings, MCOVs, type designations, OCPD requirements, model numbers, system voltages, and modes of protection.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For SPDs to include in maintenance manuals.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to replace or replace SPDs that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL SPD REQUIREMENTS

A. SPD with Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with UL 1449.

D. MCOV of the SPD shall be the nominal system voltage.

2.2 PANEL SUPPRESSORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ABB France.
2. Advanced Protection Technologies Inc. (APT).
3. Eaton Corporation.
4. Emerson Electric Co.
5. GE Zenith Controls.
6. LEA International; Protection Technology Group.
7. Leviton Manufacturing Co., Inc.
8. PowerLogics, Inc.
9. Schneider Electric Industries SAS.
10. Siemens Industry, Inc.

B. SPDs: Comply with UL 1449, Type 2.

1. Include LED indicator lights for power and protection status.
2. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
3. Include Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status.

C. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 100 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

D. Comply with UL 1283.

E. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277 V, three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: 1200 V for 480Y/277 V.
2. Line to Ground: 1200 V for 480Y/277 V.
3. Neutral to Ground: 1200 V for 480Y/277 V.

4. Line to Line: 2000 V for 480Y/277 V

F. Protection modes and UL 1449 VPR for 240/120-V, single-phase, three-wire circuits shall not exceed the following:

1. Line to Neutral: 700 V.
2. Line to Ground: 700 V.
3. Neutral to Ground: 700 V.
4. Line to Line: 1200 V.

G. SCCR: Equal or exceed 100 kA.

H. nominal Rating: 20 kA.

2.3 ENCLOSURES

A. Indoor Enclosures: NEMA 250, Type 1.

2.4 CONDUCTORS AND CABLES

A. Power Wiring: Same size as SPD leads, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Class 2 Control Cables: Multiconductor cable with copper conductors not smaller than No. 18 AWG, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Class 1 Control Cables: Multiconductor cable with copper conductors not smaller than No. 14 AWG, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install an OCPD or disconnect as required to comply with the UL listing of the SPD.

C. Install SPDs with conductors between suppressor and points of attachment as short and straight as possible, and adjust circuit-breaker positions to achieve shortest and straightest leads. Do not splice and extend SPD leads unless specifically permitted by manufacturer. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.

D. Use crimped connectors and splices only. Wire nuts are unacceptable.

E. Wiring:

1. Power Wiring: Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
2. Controls: Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. An SPD will be considered defective if it does not pass tests and inspections.

B. Prepare test and inspection reports.

3.3 STARTUP SERVICE

A. Complete startup checks according to manufacturer's written instructions.

B. Do not perform insulation-resistance tests of the distribution wiring equipment with SPDs installed. Disconnect SPDs before conducting insulation-resistance tests, and reconnect them immediately after the testing is over.

C. Energize SPDs after power system has been energized, stabilized, and tested.

3.4 DEMONSTRATION

A. Train Owner's maintenance personnel to operate and maintain SPDs.

END OF SECTION 264313

SECTION 265100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior lighting fixtures, lamps, and ballasts.
2. Emergency lighting units.
3. Exit signs.
4. Lighting fixture supports.

B. Related Sections:

1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
2. Section 262726 "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Emergency lighting units including battery and charger.
3. Ballast, including BF.
4. Energy-efficiency data.
5. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.
6. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
    a. Testing Agency Certified Data: For indicated fixtures, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining fixtures shall be certified by manufacturer.

7. Manufacturer Certified Data: Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Installation instructions.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.4 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. FM Global Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

1.5 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.6 WARRANTY

A. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Emergency Lighting Unit Batteries: 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.
2. Warranty Period for Self-Powered Exit Sign Batteries: Seven years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining six years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, product(s) indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.

B. Metal Parts: Free of burrs and sharp corners and edges.

C. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.

D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

E. Diffusers and Globes:

1. As indicated in luminaire schedule

F. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp and ballast characteristics:
2. CCT and CRI for all luminaires.

2.3 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:

1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
2. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
   a. Battery: Sealed, maintenance-free, nickel-cadmium type.

3. Charger: Fully automatic, solid-state type with sealed transfer relay.
4. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
5. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
6. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
7. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.

8. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.
9. Master/Remote Sign Configurations:
    a. Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in LED power supply for power connection to remote unit.

10. Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery, and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.

2.4 EMERGENCY LIGHTING UNITS

A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.

1. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
2. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
3. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
4. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
5. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.5 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Section 260529 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.

D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.

E. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lighting fixtures:

1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
2. The contractor shall install fixture supports as required to support all lighting fixtures adequately, providing extra steel work for the support of the fixtures if required. Any components necessary for mounting fixtures shall be provided by the contractor.

B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.

C. Remote Mounting of Ballasts: Distance between the ballast and fixture shall not exceed that recommended by ballast manufacturer. Verify, with ballast manufacturers, maximum distance between ballast and luminaire.

D. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.

1. Install ceiling support system rods or wires for each fixture. Locate not more than 6 inches from lighting fixture corners.
2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.

E. Suspended Lighting Fixture Support:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

F. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

G. Bond fixtures and metal accessories to branch circuit equipment grounding conductor.

3.2 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.4 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.

1. Adjust aimable luminaires in the presence of Architect.

END OF SECTION 265100

SECTION 270526 - GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Specifications in this section are to be used in the event that new and or additional grounding and bonding is required to fully complete the additions to the existing systems.

B. Section Includes:

1. Grounding conductors.
2. Grounding connectors.
3. Grounding busbars.
4. Grounding rods.
5. Grounding labeling.

1.3 DEFINITIONS

A. BCT: Bonding conductor for telecommunications.

B. TGB: Telecommunications grounding busbar.

C. TMGB: Telecommunications main grounding busbar.

D. Service Provider: The operator of a service that provides telecommunications transmission delivered over access provider facilities.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For communications equipment room signal reference grid. Include plans, elevations, sections, details, and attachments to other work.

1.5 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing as-built locations of grounding and bonding infrastructure, including the following:

1. Ground rods.
2. Ground and roof rings.
3. BCT, TMGB, TGBs, and routing of their bonding conductors.

B. Qualification Data: For installation company, installation supervisor, and field inspector.

C. Qualification Data: For testing agency and testing agency's field supervisor.

D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Division 01 specifications "Operation and Maintenance Data," include the following:
   a. Result of the ground-resistance test, measured at the point of BCT connection.

2. Result of the bonding-resistance test at each TGB and its nearest grounding electrode.
3. Less than 1 A for alternating current and less than 100 milliamps for direct current.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Installation Supervision: Installation shall be under the direct supervision of ITS Technician or Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
2. Field Inspector: Currently registered by BICSI as a designer RCDD or Technician to perform the on-site inspection.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

C. Comply with TIA-607-D.

2.2 CONDUCTORS

A. Comply with UL 486A-486B.

B. Insulated Conductors: Stranded copper wire, green or green with yellow stripe insulation, insulated for 600 V, and complying with UL 83.

1. Ground wire for custom-length equipment ground jumpers shall be No. 6 AWG, 19-strand, UL-listed, Type THHN wire.
2. Cable Tray Equipment Grounding Wire: No. 6 AWG.

C. Cable Tray Grounding Jumper:

1. Not smaller than No. 6 AWG and not longer than 12 inches. If jumper is a wire, it shall have a crimped grounding lug with two holes and long barrel for two crimps. If jumper is a flexible braid, it shall have a one-hole ferrule. Attach with grounding screw or connector provided by cable tray manufacturer.
2.

D. Bare Copper Conductors:

1. Solid Conductors: ASTM B3.
2. Stranded Conductors: ASTM B8.
3. Tinned Conductors: ASTM B33.
4. Bonding Cable: 28kcmils, 14 strands of No. 17 AWG conductor, and 1/4 inch in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Tinned-copper tape, braided conductors terminated with two-hole copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.3 CONNECTORS

A. Irreversible connectors listed for the purpose. Listed by an NRTL as complying with NFPA 70 for specific types, sizes, and combinations of conductors and other items connected. Comply with UL 486A-486B.

B. Compression Wire Connectors: Crimp-and-compress connectors that bond to the conductor when the connector is compressed around the conductor. Comply with UL 467.

1. Electroplated tinned copper, C and H shaped.

C. Busbar Connectors: Cast silicon bronze, solderless compression or exothermic-type, mechanical connector; with a long barrel and two holes spaced on 5/8- or 1-inch centers for a two-bolt connection to the busbar.

D. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.4 GROUNDING BUSBARS

A. TMGB: Predrilled, wall-mounted, rectangular bars of hard-drawn solid copper, 1/4 by 4 inches W minimum in cross section, length as indicated on Drawings. The busbar shall be NRTL listed for use as TMGB and shall comply with TIA-607-D.

1. Predrilling shall be with holes for use with lugs specified in this Section.
2. Mounting Hardware: Stand-off brackets that provide a 4-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
3. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

B. TGB: Predrilled rectangular bars of hard-drawn solid copper, 1/4 by 2 inches W minimum in cross section, length as indicated on Drawings. The busbar shall be for wall mounting, shall be NRTL listed as complying with UL 467, and shall comply with TIA-607-D.

1. Predrilling shall be with holes for use with lugs specified in this Section.
2. Mounting Hardware: Stand-off brackets that provide at least a 2-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
3. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

C. Rack and Cabinet Grounding Busbars: Rectangular bars of hard-drawn solid copper, accepting conductors ranging from No. 14 to No. 2/0 AWG, NRTL listed as complying with UL 467, and complying with TIA-607-D. Predrilling shall be with holes for use with lugs specified in this Section.

1. Cabinet-Mounted Busbar: Terminal block, with stainless-steel or copper-plated hardware for attachment to the cabinet.
2. Rack-Mounted Horizontal Busbar: Designed for mounting in 19- or 23-inch equipment racks. Include a copper splice bar for transitioning to an adjoining rack, and stainless-steel or copper-plated hardware for attachment to the rack.
3. Rack-Mounted Vertical Busbar: 72 or 36 inches long, with stainless-steel or copper-plated hardware for attachment to the rack.

2.5 IDENTIFICATION

A. Comply with requirements for identification products in Division 27 specifications "Identification for Communications Systems."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the ac grounding electrode system and equipment grounding for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of the electrical system.

B. Inspect the test results of the ac grounding system measured at the point of BCT connection.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with connection of the BCT only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Bonding shall include the ac utility power service entrance, the communications cable entrance, and the grounding electrode system. The bonding of these elements shall form a loop so that each element is connected to at least two others.

B. Comply with NECA 1.

C. Comply with TIA-607-D.

3.3 APPLICATION

A. Conductors: Install solid conductor for No. 8 AWG and smaller and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

1. The bonding conductors between the TGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.
2. The bonding conductors between the TMGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.

B. Underground Grounding Conductors: Install bare copper conductor, No. 2 AWG minimum.

C. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

D. Conductor Support:

1. Secure grounding and bonding conductors at intervals of not less than 36 inches.

E. Grounding and Bonding Conductors:

1. Install in the straightest and shortest route between the origination and termination point, and no longer than required. The bend radius shall not be smaller than eight times the diameter of the conductor. No one bend may exceed 90 degrees.
2. Install without splices.
3. Support at not more than 36-inch intervals.
4. Install grounding and bonding conductors in 3/4-inch PVC conduit until conduit enters a telecommunications room. The grounding and bonding conductor pathway through a plenum shall be in EMT. Conductors shall not be installed in EMT unless otherwise indicated.
    a. If a grounding and bonding conductor is installed in ferrous metallic conduit, bond the conductor to the conduit using a grounding bushing that complies with requirements in Division 27 specifications "Pathways for Communications Systems," and bond both ends of the conduit to a TGB.

3.4 GROUNDING BUSBARS

A. Indicate locations of grounding busbars on Drawings. Install busbars horizontally, on insulated spacers 2 inches minimum from wall, 12 inches above finished floor unless otherwise indicated.

B. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

3.5 CONNECTIONS

A. Bond metallic equipment in a telecommunications equipment room to the grounding busbar in that room, using equipment grounding conductors not smaller than No. 6 AWG.

B. Stacking of conductors under a single bolt is not permitted when connecting to busbars.

C. Assemble the wire connector to the conductor, complying with manufacturer's written instructions and as follows:

1. Use crimping tool and the die specific to the connector.
2. Pre-twist the conductor.
3. Apply an antioxidant compound to all bolted and compression connections.

D. Primary Protector: Bond to the TMGB with insulated bonding conductor.

E. Interconnections: Interconnect all TGBs with the TMGB with the telecommunications backbone conductor. If more than one TMGB is installed, interconnect TMGBs using the grounding equalizer conductor. The telecommunications backbone conductor and grounding equalizer conductor size shall not be less than 2kcmils/linear foot of conductor length, up to a maximum size of No. 3/0 AWG unless otherwise indicated.

F. Telecommunications Enclosures and Equipment Racks: Bond metallic components of enclosures to the telecommunications bonding and grounding system. Install vertically mounted rack grounding busbar unless the enclosure and rack are manufactured with the busbar. Bond the equipment grounding busbar to the TGB No. 2 AWG bonding conductors.

G. Structural Steel: Where the structural steel of a steel frame building is readily accessible within the room or space, bond each TGB and TMGB to the vertical steel of the building frame.

H. Shielded Cable: Bond the shield of shielded cable to the TGB in communications rooms and spaces. Comply with TIA-568.0-E and TIA-568.2-D when grounding shielded balanced twisted-pair cables.

I. Rack- and Cabinet-Mounted Equipment: Bond powered equipment chassis to the cabinet or rack grounding bar. Power connection shall comply with NFPA 70; the equipment grounding conductor in the power cord of cord- and plug-connected equipment shall be considered as a supplement to bonding requirements in this Section.

J. Cable Tray, Ladders, Runways, Conduits and Pipes:

1. Ground each cable tray, ladder and or runway section together and bond to the TMGB or TGB with a minimum No. 6 AWG insulated copper conductor.
2. Ground telecommunications conduits or pipes to the TMGB or TGB with a minimum No. 6 AWG insulated copper conductor.

3.6 IDENTIFICATION

A. Labels shall be preprinted or computer-printed type.

1. Label TMGB(s) with "fs-TMGB," where "fs" is the telecommunications space identifier for the space containing the TMGB.
2. Label TGB(s) with "fs-TGB," where "fs" is the telecommunications space identifier for the space containing the TGB.
3. Label the BCT and each telecommunications backbone conductor at its attachment point: "WARNING! TELECOMMUNICATIONS BONDING CONDUCTOR. DO NOT REMOVE OR DISCONNECT!"

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
2. Test the bonding connections of the system using an ac earth ground-resistance tester, taking two-point bonding measurements in each telecommunications equipment room containing a TMGB and a TGB and using the process recommended by BICSI TDMM. Conduct tests with the facility in operation.
   a. Measure the resistance between the busbar and the nearest available grounding electrode. The maximum acceptable value of this bonding resistance is 100 milliohms.

3. Test for ground loop currents using a digital clamp-on ammeter, with a full-scale of not more than 10 A, displaying current in increments of 0.01 A at an accuracy of plus/minus 2.0 percent.
   a. With the grounding infrastructure completed and the communications system electronics operating, measure the current in every conductor connected to the TMGB and in each TGB if present. Maximum acceptable ac current level is 1 A.

D. Excessive Ground Resistance: If resistance to ground at the BCT exceeds 5 ohms, notify Architect promptly and include recommendations to reduce ground resistance.

E. Grounding system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 270526

SECTION 270528 - PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Type OFR and Type CR communications raceways and fittings.
2. Cable supports and positioning devices.

B. Related Requirements:

1. Division 26 specifications "Seismic Controls for Electrical Systems" for seismic-load, wind-load, acoustical, and other field conditions applicable to Work specified in this Section.
2. Division 07 specifications "Penetration Firestopping" specifies firestopping for communications pathways installed by this Section.
3. Division 27 specifications "Grounding and Bonding for Communications Systems" specifies grounding and bonding conductors and connectors for communications pathways installed by this Section.
4. Division 27 specifications "Hangers and Supports for Communications Systems" specifies hangers and supports for communications pathways installed by this Section.
5. Division 26 specifications "Raceways and Boxes for Electrical Systems" specifies the following installed by this Section:
   a. Type EMT-A and Type EMT-SS duct raceways and elbows.
   b. Type EMT-S duct raceways and elbows.
   c. Type ENT duct raceways and fittings.
   d. Type HDPE and Type EPEC duct raceways and fittings.
   e. Type ERMC-A and Type ERMC-SS duct raceways, elbows, couplings, and nipples.
   f. Type ERMC-S duct raceways, elbows, couplings, and nipples.
   g. Type FMC-S and Type FMC-A duct raceways.
   h. Type FMT duct raceways.
   i. Type IMC duct raceways.
   j. Type LFMC duct raceways.
   k. Type LFNC duct raceways.
   l. Type PVC duct raceways and fittings.
   m. Type RTRC-AG duct raceways and fittings.
   n. Type RTRC-BG duct raceways and fittings.
   o. Fittings for conduit, tubing, and cable.
   p. Electrically conductive corrosion-resistant compounds for threaded conduit.
   q. Solvent cements.
   r. Metallic outlet boxes, device boxes, rings, and covers.
   s. Nonmetallic outlet boxes, device boxes, rings, and covers.
   t. Junction boxes and pull boxes.
   u. Cover plates for device boxes.
   v. Hoods for outlet boxes.
   w. Surface metal raceways and fittings.

x. Surface nonmetallic raceways.
y. Strut-type channel raceways and fittings.
z. Wireways and auxiliary gutters.

6. Division 27 specifications "Cable Trays for Communications Systems" specifies cable trays for communications pathways installed by this Section.
7. Division 26 specifications "Underground Ducts and Raceways for Electrical Systems" specifies the following installed by this Section:
   a. Duct accessories.
   b. Handholes and boxes for exterior underground wiring.
   c. Manholes for exterior underground wiring.
   d. Utility structure accessories.
   e. Duct sealing.

8. Division 27 specifications "Sleeves and Sleeve Seals for Communications Pathways and Cabling" specifies sleeves and sleeve seals for communications pathways installed by this Section.
9. Division 27 specifications "Identification for Communications Systems" specifies labels and warning signs for communications pathways installed by this Section.
10. Division 26 specifications "Electrical Cabinets and Enclosures" for communications enclosures installed by this Section.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of product.
   a. Product Listing: Include copy of unexpired approval letter, on letterhead of qualified electrical testing agency, certifying product's compliance with specified listing criteria.
      1) If listed manufacturer differs from selling manufacture, indicate relationship between entities on submittal. Clearly indicate which entity warrants product performance and fitness for purpose.
      2) Listing criteria identified in approval letter must match specified listing criteria. Approval of only equipment's enclosure is not considered approval of equipment for intended application.
      3) Product identification in approval letter must match product branding and model numbers in submittal. Approval letters for similar products are not acceptable.

1.3 INFORMATIONAL SUBMITTALS

A. Manufacturers' published instructions submittals.

PART 2 - PRODUCTS

2.1 TYPE OFR AND TYPE CR COMMUNICATIONS RACEWAYS AND FITTINGS

A. Description: This product group covers raceways and fittings for installation of conductive and nonconductive optical-fiber cable, communications cable, power-limited fire-alarm cable, signaling cable, and coaxial cable in accordance with NFPA 70.

B. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria:
   a. Optical-Fiber Cable Raceway: UL CCN QAZM; including UL 2024.
   b. Communications Cable Raceway: UL CCN QBAA; including UL 2024.

C. UL QAZM - Type OFR-GP General-Purpose Optical-Fiber Raceway :

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   a. Wiremold.
   b. Panduit.
   c. Hubbel.

2. Source Limitations: Obtain products from single manufacturer.
3. Product Characteristics:
   a. Texture: Smooth.
   b. Metallic: Steel.
   c. Surface mount.

4. Required Product Options:
   a. Couplings and Fittings:
      1) Per the optical-fiber raceway manufacturers requirements.
   b. Colors:
      1) Per the owners requirements.

D. UL QBAA - Type CR-GP General-Purpose Communications Cable Raceway :

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. CommScope, Inc.
   b. Dura-Line.
   c. Eaton.

2. Source Limitations: Obtain products from single manufacturer.
3. Product Characteristics:
   a. Texture: Smooth.

b. Metallic: Steel

4. Required Product Options:
   a. Couplings and Fittings:
      1) Per the optical-fiber raceway manufacturers requirements .
   b. Colors:
      1) For Communications: To match existing.
      2) For Signaling: To match existing.

2.2 CABLE SUPPORTS AND POSITIONING DEVICES

A. Description: This category covers straps, hooks, and similar types of hardware for installation and use in communications cabling systems in accordance with NFPA 70 and manufacturer's installation instructions

B. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

C. UL DWMU - Conduit or Cable Support Strap :

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. ABB, Electrification Business.
   b. Cooper B-line; brand of Eaton, Electrical Sector.

2. Source Limitations: Obtain products from single manufacturer.
3. Product Listing Criteria: UL CCN DWMU; including UL 2239 or UL 1565.
4. Product Characteristics:
   a. Mounting Orientation: Vertical or Horizontal.

D. UL ZODZ - Cable Tie or Management System :

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. 3M Company, Electrical Markets Div (EMD).
   b. ABB, Electrification Business.
   c. HellermannTyton.

2. Source Limitations: Obtain products from single manufacturer.
3. Product Listing Criteria: UL CCN ZODZ; including UL 62275.
4. Product Characteristics:
   a. Classification: Type 2 or 21.
   b. Tensile Strength: minimum 30lb.
   c. UL 746B Maximum Temperature Rating: ,105° C.
   d. Fixing Device: Integral assembly.

E. UL ZODZ - Cable Clamp, Clip, or Mount Positioning Device :

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. CADDY; brand of nVent Electrical plc.
   b. Panduit Corp.

2. Source Limitations: Obtain products from single manufacturer.
3. Product Listing Criteria: UL CCN ZODZ; including UL 1565.
4. Product Characteristics:
   a. Materials: Metallic.
   b. Mechanical Strength: 34 kg.
   c. UL 746B Maximum Temperature Rating: 120 deg C, to 250 deg C.

5. Required Product Options:
   a. Fixing Device: with mechanical fastener.
   b. Resistant to ultraviolet light.
   c. Resistant to corrosion.

PART 3 - EXECUTION

3.1 SELECTION OF PATHWAYS FOR COMMUNICATIONS SYSTEMS

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NFPA 70 for selection of duct raceways. Consult Architect for resolution of conflicting requirements.

B. Type OFR and Type CR Communications Raceways: Comply with Table 800.154(b) of NFPA 70.

C. Minimum Pathway Size:

1. For Copper and Aluminum Cables: Metric designator 21 (trade size 3/4).

D. Maximum Pathway Length Between Cable Access Points: 75 ft.

E. Temperature Limitations:

1. Type PVC, Type HDPE, Type EPEC, Type OFR, and Type CR: Do not install where ambient temperature exceeds 122 deg F . Conductor ratings must be limited to 75 deg C except where installed in a trench outside buildings with concrete encasement, where 90 deg C conductors are permitted.
2. Type RTRC: Do not install where ambient temperature exceeds 230 deg F .

F. Outdoor Pathways:

1. Exposed and Subject to Severe Physical Damage: ERMC or IMC.
2. Exposed and Subject to Physical Damage: ERMC or IMC or Corrosion-resistant EMT.

a. Locations less than 2.5 m (8 ft) above finished floor.

3. Exposed and Not Subject to Physical Damage: ERMC, IMC, Corrosion-resistant EMT, PVC-80, RTRC-AG, LFMC or LFNC.

G. Indoor Pathways:

1. Exposed and Subject to Physical Damage: ERMC, IMC or EMT. Locations include the following:
   a. Locations less than 2.5 m (8 ft) above finished floor.
   b. Stub-ups to above suspended ceilings.

2. Exposed and Not Subject to Physical Damage: ERMC, IMC, EMT, RTRC-AG, LFMC.
3. Damp or Wet Locations: ERMC, IMC, RTRC-AG, Corrosion-resistant EMT, LFMC or LFNC.
4. In Vertical Runs: ERMC, IMC, EMT, RTRC-AG, OFR-P , OFR-R, CR-P or CR-R.

H. Duct Fittings: Select fittings in accordance with NEMA FB 2.10 guidelines.

1. ERMC and IMC: Provide threaded-type fittings unless otherwise indicated.

I. Surface Raceways: Where indicated on Drawings.

J. Cable Supports and Positioning Devices:

1. Size hooks to allow minimum of 25 percent future capacity without exceeding design capacity limits.
2. Support hooks directly from building structure. Do not use ceiling grid support rods or wires.
3. Hook spacing must allow no more than 6 inch of slack. Lowest point of cables must be no closer than 6 inch to ceiling tiles, mechanical ductwork and fittings, luminaires, power conduits, power and telecommunications outlets, and other electrical and communications equipment.
4. Space hooks no more than 5 ft on center.
5. Provide hook at each change in direction.

K. Boxes and Enclosures:

1. Outdoors, Aboveground: UL 50E Type 3RorType 4.
2. Indoors: UL 50E Type 1, except use Type 4 stainless steel or nonmetallic units in institutional and commercial kitchens and damp or wet locations.

L. Identification of Underground Pathways, Handholes, and Structures:

1. Use "COMMUNICATIONS" for legend on warning planks, underground warning tape, and covers.

3.2 SELECTION OF GROUNDING AND BONDING PRODUCTS

A. Grounding and Bonding Conductors:

1. Communications Busbar Connections:
   a. TBC: Not smaller than 1/0 AWGor3/0 AWG and no smaller than largest TBB.
   b. UBC: Not smaller than 6 AWG unless otherwise indicated on Drawings. Provide bolted connectors.
   c. Bonding Conductors to Structural Steel: Not smaller than 6 AWG unless otherwise indicated on Drawings. Provide bolted clamp connectors.

3.3 SELECTION OF COLORS AND IDENTIFICATION MARKINGS

A. Comply with 29 CFR 1910.144 for color identification of hazards, and the following:

1. Fire-protection and fire-alarm equipment , including raceways, must be finished, painted, or suitably marked safety red.
2. Ceiling-mounted hangers, supports, cable trays, and raceways must be finished, painted, or suitably marked safety yellow where less than 8ft above finished floor.

B. Pipe and Conduit Labeling: Comply with ASME A13.1 and IEEE C2.

C. Color Coding Scheme for Communications Cable and Terminations: Comply with BICSI N1 and TIA-598.

D. Accessible Fittings for Raceways: Identify cover of junction and pull box of the following systems with wiring system legend and system voltage. System legends must be as follows:

1. "COMMUNICATIONS."
2. "FIRE ALARM."
3. "SECURITY."
4. “ACCESS CONTROL.”

E. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

F. Communications Vaults, Manholes, Handholes, and Pull and Junction Boxes: For conductors in vaults, pull and junction boxes, manholes, and handholes, use self-adhesive wraparound labels or snap-around labels to identify phase.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50 ft maximum intervals in straight runs, and at 25 ft maximum intervals in congested areas.

G. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with conductor or cable designation, origin, and destination.

H. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive labels with conductor designation.

I. Conductors To Be Extended in Future: Attach write-on tags marker tape to conductors and list source.

J. Auxiliary Electrical Systems Conductor Identification: Marker tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

K. Equipment and Cabling Identification for Administrative Records and Labeling: Comply with TIA-606 requirements for Class 2 network administration.

L. Equipment Identification Labels:

1. Black letters on white field.
2. Indoor Equipment: Self-adhesive label .
3. Outdoor Equipment: Laminated acrylic or melamine sign .
4. Equipment To Be Labeled:
   a. Racks, Frames, and Enclosures: Identify front and rear of each enclosure with self-adhesive labels containing equipment designation.
   b. Patch Panels: Label individual rows in each rack, starting at top and working down, with self-adhesive labels.
   c. Communications cabinets.
   d. Access doors and panels for concealed communications items.
   e. Emergency system boxes and enclosures.
   f. Contactors.
   g. Remote-controlled switches, dimmer modules, and control devices.
   h. Monitoring and control equipment.
   i. Fire-alarm equipment.
   j. Security equipment.
   k. Life-safety communications equipment.
   l. Fiber Optical equipment .

M. Horizontal Cables: Label each cable with a self-adhesive wraparound label.

N. Cover Plates: Label individual cover plates with self-adhesive labels. Place label at top of cover plate. Identify cover plate in accordance with TIA-606.

O. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Air Spaces Handling Environmental: Plenum rated.

3.4 SELECTION OF SIGNS AND HAZARD MARKINGS

A. Comply with 29 CFR 1910.145 for danger, caution, warning, and safety instruction signs.

B. Signs, labels, and tags required for personnel safety must comply with the following standards:

1. Safety Colors: NEMA Z535.1.
2. Facility Safety Signs: NEMA Z535.2.
3. Safety Symbols: NEMA Z535.3.
4. Product Safety Signs and Labels: NEMA Z535.4.
5. Safety Tags and Barricade Tapes for Temporary Hazards: NEMA Z535.5.

C. Electrical Hazard Warnings:

1. Multiple Power Sources Warning Legend: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT/RACK HAS MULTIPLE POWER SOURCES."

D. Operating Instruction Signs: Self-adhesive labels .

E. Emergency Operating Instruction Signs: Baked-enamel warning signs with white legend on red background with minimum 3/8" high letters for emergency instructions at equipment used for high letters for emergency instructions

3.5 INSTALLATION OF PATHWAYS FOR COMMUNICATIONS SYSTEMS

A. Comply with manufacturers' published instructions, including limitations on distance, bends, and bend radius.

B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:

1. Type OFR Optical-Fiber Raceways: Article 800 of NFPA 70 and BICSI N1.
2. Type CR Communications Raceways: Article 800 of NFPA 70 and BICSI N1.
3. Cable Supports and Positioning Devices: Article 800 of NFPA 70 and BICSI N1.
4. Consult Architect for resolution of conflicting requirements.

C. Special Installation Techniques:

1. Complete communications raceway installation before starting conductor installation.
2. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.
3. Provide hangers and supports for pathways, boxes, and enclosures.
4. Firestop pathway penetrations of fire-rated assemblies.
5. Identification:
   a. Provide colors and labels for pathways, boxes, enclosures, and associated communications equipment as indicated on Drawings.
   b. Provide safety warning signs.

D. Interfaces with Other Work:

1. Coordinate installation of new communications pathways with existing conditions.
   a.

2. Grounding and Bonding: Bond metallic communications boxes and enclosures to metallic pathways. Coordinate with Division 27 specifications "Grounding and Bonding for Communications Systems" for grounding and bonding of communications pathways to communications equipment room fittings.

3.6 PROTECTION

A. Protect coatings and finishes of pathways, boxes, and enclosures from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 270528

SECTION 270529 - HANGERS AND SUPPORTS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel slotted support systems for communication raceways.
2. Aluminum slotted support systems for communication raceways.
3. Nonmetallic slotted support systems for communication raceways.
4. Conduit and cable support devices.
5. Support for conductors in vertical conduit.
6. Structural steel for fabricated supports and restraints.
7. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
8. Fabricated metal equipment support assemblies.

B. Related Requirements:

1. Division 27 specifications – Seismic Controls for Communications Systems

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
   a. Slotted support systems, hardware, and accessories.
   b. Clamps.
   c. Hangers.
   d. Sockets.
   e. Eye nuts.
   f. Fasteners.
   g. Anchors.
   h. Saddles.
   i. Brackets.

2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. For fabrication and installation details for communications hangers and support systems.

1. Trapeze hangers. Include product data for components.
2. Steel slotted-channel systems.
3. Aluminum slotted-channel systems.

4. Nonmetallic slotted-channel systems.
5. Equipment supports.
6. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal: For hangers and supports for communications systems.

1. Include design calculations and details of trapeze hangers.
2. Include design calculations for seismic restraints.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Ductwork, piping, fittings, and supports.
3. Structural members to which hangers and supports will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling, including the following:
   a. Luminaires.
   b. Air outlets and inlets.
   c. Speakers.
   d. Sprinklers.
   e. Access panels.
   f. Cameras
   g. HVAC
   h. Access control products

B. Welding certificates.

C. Seismic Qualification Data: Certificates, for hangers and supports for communications equipment and systems, accessories, and components, from manufacturer.1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M and AWS D1.2/D1.2M.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M.
2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 specifications "Quality Requirements," to design hanger and support system.

B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."2. Component Importance Factor: 1.5.

C. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame Rating: Class 1.
2. Self-extinguishing according to ASTM D635.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Sprung Structure: Use only hardware as defined by Srung Structure manufacturer to attach to the structure itself. Refer to Sprung Structure manufacturer installation instructions for additional information on methods and attachment points.

B. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch- (10-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c. in at least one surface.

1. Manufacturers: ABB, Gripple Inc., Robroy Industries or equal
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel, Plain steel, Stainless Steel, Type 304 or Stainless Steel, Type 316.
4. Channel Width: Selected for applicable load criteria.
5. Retain one or more of "Metallic Coatings," "Nonmetallic Coatings," and "Painted Coatings" subparagraphs below. Coordinate with the appropriate coating or painting Specification Section.
6. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
7. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
8. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
9. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
10. Channel Dimensions: Selected for applicable load criteria.

C. Aluminum Slotted Support Systems: Extruded aluminum channels and angles with minimum 13/32-inch- (10-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c. in at least one surface.

1. Manufacturers: ABB, Atkore, Eaton or equal
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Channel Material: 6063-T6 aluminum alloy.
4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
5. Channel Width: Selected for applicable load criteria.
6. Retain one of or both "Nonmetallic Coatings" and "Painted Coatings" subparagraphs below. Coordinate with the appropriate coating or painting Specification Section.
7. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
8. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
9. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
10. Channel Dimensions: Selected for applicable load criteria.

D. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with minimum 13/32-inch- (10-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c., in at least one surface.

1. Manufacturers: Champion Fiberglass, Atkore, Eaton or equal
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Channel Width: Selected for applicable load criteria.
4. Fittings and Accessories: Products provided by channel and angle manufacturer and designed for use with those items.
5. Fitting and Accessory Materials: Same as those for channels and angles.
6. Rated Strength: Selected to suit applicable load criteria.
7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

E. Conduit and Cable Support Devices: Steel, Steel and malleable-iron, Stainless-steel or Glass-fiber-resin clamps, hangers, and associated fittings, designed for types and sizes of raceway or cable to be supported.

F. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored communications conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

G. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.

H. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel or stainless steel stud for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Dewalt, Hilti, Simpson Strong Tie

2. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel or stainless steel for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

a. Hilti, Red Head, Simpson Strong Tie

3. Concrete Inserts: Steel, malleable-iron or stainless steel, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325 (Grade A325M).
6. Toggle Bolts: All-steel or Stainless-steel springhead type.
7. Hanger Rods: Threaded, steel or stainless steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Division 05 specifications "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers,

B. Consult structural engineer for requirements in this article and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA 1.
2. NECA/BICSI 568.
3. TIA-569-E.
4. NECA 101.
5. NECA 102.
6. NECA 105.
7. NECA 111.

C. Comply with requirements in Division 07 specifications "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

D. Comply with requirements for pathways specified in Division 27 specifications "Pathways for Communications Systems."

E. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

F. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps, single-bolt conduit clamps or single-bolt conduit clamps, using spring friction action for retention in support channel, sized according to weight capacity.

G. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

H. Comply with the “Sprung Structure” requirements for allowable frame load ratings of supports.

3.2 SUPPORT INSTALLATION

A. Follow Sprung Structure manufacturer support methods. Deviations must be approved by Sprung Structure manufacturer technical support group prior to installation of supports, hangers or any other support.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb. (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten communications items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Use approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Use expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated-driven threaded studs, provided with lock washers and nuts, may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69 or Spring-tension clamps.
7. To Light Steel: Sheet metal screws.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 05 specifications "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor communications materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements in Division 09 specifications "Exterior Painting", "Interior Painting" and "High-Performance Coatings" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas, and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION 270529

SECTION 270536 - CABLE TRAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cable Runway (Ladder rack)
2. Ladder cable tray.
3. Wire-mesh cable tray.
4. Cable runway/tray accessories.
5. Warning signs.

B. Related Requirements:

1. Division 27 specifications “Hangers and Supports for Communications Systems”.
2. Division 27 specifications “Seismic Controls for Communications Systems”.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of cable tray.

1. Include data indicating dimensions and finishes for each type of cable tray indicated.

B. Shop Drawings: For each type of cable tray.

1. Show fabrication and installation details of cable trays, including plans, elevations, and sections of components and attachments to other construction elements. Designate components and accessories, including clamps, brackets, hanger rods, splice-plate connectors, expansion-joint assemblies, straight lengths, and fittings.
2. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:
   a. Vertical and horizontal offsets and transitions.
   b. Clearances for access above and to sides of cable trays.
   c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
   d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans and sections, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Scaled cable tray layout and relationships between components and adjacent structural, electrical, and mechanical elements.
2. Vertical and horizontal offsets and transitions.
3. Clearances for access above and to side of cable trays.
4. Vertical elevation of cable trays above the floor or below bottom of ceiling structure.

B. Seismic Qualification Data: Certificates, for cable trays, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Cable trays and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the cable trays will remain in place without separation of any parts when subjected to the seismic forces specified."

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes in cable tray installed outdoors.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 GENERAL REQUIREMENTS FOR CABLE TRAYS

A. Cable Trays and Accessories: Identified as defined in NFPA 70 and marked for intended location, application, and grounding.

1. Source Limitations: Obtain cable trays and components from single manufacturer.

B. Sizes and Configurations: See the Cable Tray information on drawings for specific requirements for types, materials, sizes, and configurations.

C. Structural Performance: See articles for individual cable tray types for specific values for the following parameters:

1. Uniform Load Distribution: Capable of supporting a uniformly distributed load on the indicated support span when supported as a simple span and tested according to NEMA VE 1.
2. Concentrated Load: A load applied at midpoint of span and centerline of tray.
3. Load and Safety Factors: Applicable to both side rails and rung capacities.

2.3 LADDER CABLE TRAY

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Cooper B-line; brand of Eaton, Electrical Sector.
2. Cope; Atkore International.
3. Mono Systems, Inc.
4. MP Husky USA Cable Tray & Cable Bus.

B. Description:

1. Configuration: Two longitudinal side rails with transverse rungs swaged or welded to side rails, complying with NEMA VE 1.
2. Width: 12 inches unless otherwise indicated on Drawings.
3. Minimum Usable Load Depth: 3 inches.
4. Straight Section Lengths: 10 feet, except where shorter lengths are required to facilitate tray assembly.
5. Rung Spacing: 12 inches on center, maximum.
6. Radius-Fitting Rung Spacing: 9 inches at center of tray's width.
7. Minimum Cable-Bearing Surface for Rungs: 7/8-inch width with radius edges.
8. No portion of the rungs shall protrude below the bottom plane of side rails.
9. Structural Performance of Each Rung: Capable of supporting a maximum cable load, with a safety factor of 1.5, plus a 200-lb concentrated load, when tested according to NEMA VE 1.
10. Fitting Minimum Radius: 24 inches.
11. Splicing Assemblies: Bolted type using serrated flange locknuts.
12. Splice-Plate Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.

C. Materials and Finishes:

1. Aluminum (For exterior use):
   a. Materials: Alloy 6063-T6 according to ANSI H35.1/H 35.1M for extruded components, and Alloy 5052-H32 or Alloy 6061-T6 according to ANSI H35.1/H 35.1M for fabricated parts.
   b. Hardware: Stainless steel, Type 316, ASTM F593 and ASTM F594.
   c. Hardware for aluminum cable tray used outdoors: Stainless steel, Type 316, ASTM F593 and ASTM F594.

2.4 WIRE-MESH CABLE TRAY

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Cablofil; Legrand North America, LLC.
2. Cooper B-line; brand of Eaton, Electrical Sector.
3. Cope; Atkore International.
4. Mono Systems, Inc.
5. MP Husky USA Cable Tray & Cable Bus.

B. Description:

1. Configuration: Galvanized-steel wire mesh, complying with NEMA VE 1.
2. Width: 12 inches unless otherwise indicated on Drawings.
3. Minimum Usable Load Depth: 4 inches.
4. Straight Section Lengths: 10 feet, except where shorter lengths are required to facilitate tray assembly.
5. Structural Performance: Capable of supporting a maximum cable load, with a safety factor of 1.5, plus a 200-lb concentrated load, when tested according to NEMA VE 1.
6. Splicing Assemblies: Bolted type using serrated flange locknuts.
7. Splice-Plate Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.

C. Materials and Finishes:

1. Steel:
2. Straight Sections and Fittings
3. Steel Tray Splice Plates: ASTM A1011/A1011M, HSLAS, Grade 50, Class 1.
4. Fasteners: Steel complies with the minimum mechanical properties of ASTM A510/A510M, Grade 1008.
5. Finish: Powder-coat enamel paint.
   a. Powder-Coat Enamel: Cable tray manufacturer's recommended primer and corrosion-inhibiting treatment, with factory-applied powder-coat paint.
   b. Hardware: Chromium-zinc plated, ASTM F1136.

2.5 CABLE RUNWAY AND TRAY ACCESSORIES

A. Fittings: Tees, crosses, risers, elbows, radius drops, and other fittings as indicated, of same materials and finishes as cable tray.

B. Splices: Cable tray/runway manufacturer specified splices.

C. Cable waterfalls: Manufacturer-specified at each location where cabling drops down into vertical cable management/racks/cabinets.

D. Barrier Strips: Same materials and finishes as for cable tray.

E. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.

F. Roof blocks: UV-resistant rubber blocks with galvanized steel mounting channel across entire top section of block.

2.6 WARNING SIGNS

A. Comply with requirements for identification in Division 27 specifications "Identification for Communications Systems."

B. Lettering: 1-1/2-inch-high, black letters on yellow background with legend "Warning! Not To Be Used as Walkway, Ladder, or Support for Ladders or Personnel."

2.7 SOURCE QUALITY CONTROL

A. Testing: Test and inspect cable trays according to NEMA VE 1.

2.8 CABLE TRAY INSTALLATION

A. Install cable trays according to NEMA VE 2.

B. Install cable trays as a complete system, including fasteners, hold-down clips, support systems, barrier strips, adjustable horizontal and vertical splice plates, elbows, reducers, tees, crosses, cable dropouts, adapters, covers, and bonding.

C. Install cable trays so that the tray is accessible for cable installation and all splices are accessible for inspection and adjustment.

D. Remove burrs and sharp edges from cable trays.

E. Fasten cable tray supports to building structure.

F. Design fasteners and supports to carry cable tray, the cables, and a concentrated load of 200 lb. Comply with requirements in Division 27 specifications "Hangers and Supports for Communications Systems".

G. Place supports so that spans do not exceed maximum spans on schedules and provide clearances shown on Drawings. Install intermediate supports when cable weight exceeds the load-carrying capacity of the tray rungs.

H. Construct supports from channel members, threaded rods, and other appurtenances furnished by cable tray manufacturer. Arrange supports in trapeze or wall-bracket form as required by application.

I. Support bus assembly to prevent twisting from eccentric loading.

J. Locate and install supports according to NEMA VE 2. Do not install more than one cable tray splice between supports.

K. Support wire-basket cable trays with trapeze hangers or wall brackets.

L. Support trapeze hangers for wire-basket trays with 3/8-inch-diameter rods for 12” and smaller and ½-inch-diameter rods for 12” and larger.

M. Make connections to equipment with flanged fittings fastened to cable trays and to equipment. Support cable trays independent of fittings. Do not carry weight of cable trays on equipment enclosure.

N. Install expansion connectors where cable trays cross building expansion joints and in cable tray runs that exceed dimensions recommended in NEMA VE 2. Space connectors and set gaps according to applicable standard.

O. Make changes in direction and elevation using manufacturer's recommended fittings.

P. Make cable tray connections using manufacturer's recommended fittings.

Q. Seal penetrations through fire and smoke barriers. Comply with requirements in Division 07 specifications "Penetration Firestopping."

R. Install capped metal sleeves for future cables through firestop-sealed cable tray penetrations of fire and smoke barriers.

S. Install cable trays with enough workspace to permit access for installing cables.

T. Install barriers to separate cables of different systems, such as power, communications, and data processing; or of different insulation levels, such as 600, 5000, and 15 000 V.

U. Install warning signs in visible locations on or near cable trays after cable tray installation.

2.9 CABLE TRAY GROUNDING

A. Ground cable trays according to NFPA 70 unless additional grounding is specified. Comply with requirements in Division 27 specifications "Grounding and Bonding for Communications Systems."

B. Cable trays shall be bonded together with splice plates listed for grounding purposes or with listed bonding jumpers.

C. Cable trays with single-conductor power conductors shall be bonded together with a grounding conductor run in the tray along with the power conductors and bonded to the tray at 72-inch intervals. The grounding conductor shall be sized according to NFPA 70, Article 250.122, "Size of Equipment Grounding Conductors," and Article 392, "Cable Trays."

D. When using epoxy- or powder-coat painted cable trays as a grounding conductor, completely remove coating at all splice contact points or ground connector attachment. After completing splice-to-grounding bolt attachment, repair the coated surfaces with coating materials recommended by cable tray manufacturer.

E. Bond cable trays to power source for cables contained within with bonding conductors sized according to NFPA 70 Article, "Size of Equipment Grounding Conductors."

2.10 CABLE INSTALLATION

A. Install cables only when each cable tray run has been completed and inspected.

B. Fasten cables on horizontal runs with hook-and-loop cable ties according to NEMA VE 2. Tighten cable ties only enough to secure the cable, without indenting the cable jacket.

C. Fasten cables on vertical runs to cable trays every 18 inches.

D. Fasten and support cables that pass from one cable tray to another or drop from cable trays to equipment enclosures. Fasten cables to the cable tray at the point of exit and support cables independent of the enclosure. The cable length between cable trays or between cable tray and enclosure shall be no more than 72 inches.

E. Tie cables down every 36 inches where required to provide a 2-hour fire rating and every 72 inches elsewhere.

F. In existing construction, remove inactive or dead cables from cable trays.

2.11 CONNECTIONS

A. Remove paint from all connection points before making connections. Repair paint after the connections are completed.

B. Connect pathways to cable trays according to requirements in NEMA VE 2 and NEMA FG 1.

2.12 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. After installing cable trays and after electrical circuitry has been energized, survey for compliance with requirements.
2. Visually inspect cable insulation for damage. Correct sharp corners, protuberances in cable trays, vibrations, and thermal expansion and contraction conditions, which may cause or have caused damage.
3. Verify that the number, size, and voltage of cables in cable trays do not exceed that permitted by NFPA 70. Verify that communications or data-processing circuits are separated from power circuits by barriers or are installed in separate cable trays.
4. Verify that there are no intruding items such as pipes, hangers, or other equipment in the cable tray.
5. Remove dust deposits, industrial process materials, trash of any description, and any blockage of tray ventilation.
6. Visually inspect each cable tray joint and each ground connection for mechanical continuity. Check bolted connections between sections for corrosion. Clean and retorque in suspect areas.
7. Check for improperly sized or installed bonding jumpers.
8. Check for missing, incorrect, or damaged bolts, bolt heads, or nuts. When found, replace with specified hardware.

9. Perform visual and mechanical checks for adequacy of cable tray grounding; verify that all takeoff raceways are bonded to cable trays. Test entire cable tray system for continuity. Maximum allowable resistance is 1 ohm.

B. Prepare test and inspection reports.

2.13 PROTECTION

A. Protect installed cable trays and cables.

1. Install temporary protection for cables in open trays to safeguard exposed cables against falling objects or debris during construction. Temporary protection for cables and cable tray can be constructed of wood or metal materials and shall remain in place until the risk of damage is over.
2. Repair damage to galvanized finishes with zinc-rich paint recommended by cable tray manufacturer.
3. Repair damage to paint finishes with matching touchup coating recommended by cable tray manufacturer.

END OF SECTION 270536

SECTION 270544 - SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Division 07 specifications "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized-steel sheet.
2. Minimum Metal Thickness:
   a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
   b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

1. Manufacturers: Polywater Solutions, Roxtec or equal.
2. Retain first option in "Sealing Elements" Subparagraph below unless Nitrile (Buna N) rubber gasket material is required because hydrocarbons are present in the soil.
3. Sealing Elements: EPDM, Nitrile (Buna N) rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
4. Pressure Plates: Carbon steel, Plastic or Stainless steel.
5. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating or Stainless steel of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Polywater Solutions, Roxtec, Specified Technologies or equal.

2.4 GROUT

A. Description: Non-shrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
   a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 specifications "Joint Sealants."
   b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall, so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide minimum 1/4-inch annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors minimum 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Sprung Structure, Exterior-Wall Penetrations: Provide and install Sprung Structure kits per manufacture's instructions.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 270544

SECTION 270548.16 - SEISMIC CONTROLS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Restraint channel bracings.
2. Restraint cables.
3. Seismic-restraint accessories.
4. Mechanical anchor bolts.
5. Adhesive anchor bolts.

B. Related Requirements:

1. Division 27 specifications "Hangers and Supports for Communications Systems" for commonly used supports and installation requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
   a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by OSHPD or an agency acceptable to authorities having jurisdiction.
   b. Annotate to indicate application of each product submitted and compliance with requirements.

B. Delegated-Design Submittal: For each seismic-restraint device.

1. Include design calculations and details for selecting seismic restraints complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Design Calculations: Calculate static and dynamic loading caused by equipment weight, operation, and seismic and wind forces required to select seismic and wind restraints and for designing vibration isolation bases.

a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

3. Seismic- and Wind-Restraint Details:
   a. Design Analysis: To support selection and arrangement of seismic and wind restraints. Include calculations of combined tensile and shear loads.
   b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
   c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.
   d. Preapproval and Evaluation Documentation: By OSHPD or an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints. Communications components include:

1. Uninterruptible power supplies.
2. Racks.
3. Frames.
4. Cabinets.
5. Cable tray.
6. Conduits.

B. Qualification Data: For professional engineer and testing agency.

C. Welding certificates.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis. They shall bear anchorage preapproval from OSHPD in addition to preapproval, showing maximum seismic-restraint ratings, by ICC-ES or another agency acceptable to authorities having jurisdiction. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) that support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

E. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Wind-Restraint Loading:

1. Basic Wind Speed: 90mph.
2. Building Classification Category: V .
3. Minimum 10 lb./sq. ft. multiplied by maximum area of component projected on vertical plane normal to wind direction and 45 degrees either side of normal.

B. Seismic-Restraint Loading:

1. Site Class as Defined in the IBC: D.
2. Assigned Seismic Use Group or Building Category as Defined in the IBC: II.
   a. Component Importance Factor: 1.0
   b. Component Response Modification Factor: 2.5 and 6 (cable tray) .
   c. Component Amplification Factor: 1.0 .
3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 1.077 .
4. Design Spectral Response Acceleration at 1.0-Second Period: .396.

2.2 RESTRAINT CHANNEL BRACINGS

A. Manufacturers: Eaton, nVent or equal.

B. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end, with other matching components, and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.3 RESTRAINT CABLES

A. Manufacturers: Eaton, nVent or equal.

B. Restraint Cables: ASTM A603 galvanized or ASTM A492 stainless-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.4 SEISMIC-RESTRAINT ACCESSORIES

A. Manufacturers: Eaton, nVent or equal.

B. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or Reinforcing steel angle clamped to hanger rod.

C. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

D. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

E. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

F. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.5 MECHANICAL ANCHOR BOLTS

A. Manufacturers: Eaton, nVent or equal.

B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E488.

2.6 ADHESIVE ANCHOR BOLTS

A. Manufacturers: Hilti, Simpson Strong-Tie or equal.

B. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E488.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by OSHPD or an agency acceptable to authorities having jurisdiction.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods caused by seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Division 03 specifications "Cast-in-Place Concrete."

B. Equipment and Hanger Restraints:

1. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
2. Install seismic-restraint devices using methods approved by OSHPD or an agency acceptable to authorities having jurisdiction providing required submittals for component.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

E. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

F. Drilled-in Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
5. Set anchors to manufacturer's recommended torque using a torque wrench.
6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where connection is terminated to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.
3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
5. Test to 90 percent of rated proof load of device.

C. Seismic controls will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.6 ADJUSTING

A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 270548.16

SECTION 270553 - IDENTIFICATION FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Color and legend requirements for labels and signs.
2. Labels.
3. Bands and tubes.
4. Tapes.
5. Signs.
6. Cable ties.
7. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for communications identification products.

B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule:

1. Outlets: Scaled drawings indicating location and proposed designation.
2. Backbone Cabling: Riser diagram showing each communications room, backbone cable, and proposed backbone cable designation.
3. Racks: Scaled drawings indicating location and proposed designation.
4. Patch Panels: Enlarged scaled drawings showing rack row, number, and proposed designations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 70 and TIA 606-C.

B. Comply with ANSI Z535.4 for safety signs and labels.

C. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Equipment Identification Labels:

1. Black letters on a white field.
2. Use lettering color to contrast equipment where black is not appropriate and a use a field/background to contrast lettering color.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

1. Manufacturers: Brady Corp. or equal.

B. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters of raceway or cable they identify, that stay in place by gripping action.

1. Manufacturers: Brady Corp. or equal.

C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil- thick, polyester or vinyl flexible labels with acrylic pressure-sensitive adhesive.

1. 1, Manufacturers: Brady Corp. or equal.
2. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating protective shields over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
3. Marker for Labels: Permanent, waterproof black ink marker recommended by tag manufacturer.
4. Marker for Labels: Machine-printed, permanent, waterproof black ink recommended by printer manufacturer.

D. Self-Adhesive Labels: Polyester or Vinyl, thermal, transfer-printed, 3-mil- thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Manufacturers: Brady Corp. or equal.
2. Minimum Nominal Size:

a. 1-1/2 by 6 inches for raceway and conductors
b. 3-1/2 by 5 inches for equipment.
c. As required by authorities having jurisdiction.

2.4 BANDS AND TUBES

A. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters of raceway or cable they identify, that stay in place by gripping action.

1. Manufacturers: Brady Corp. or equal.

2.5 CABLE TIES

A. Manufacturers: Panduit, T&B or equal.

B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F according to ASTM D638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F.
5. Color: Black.

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying communications identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of communications systems and connected items.

G. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

H. Vinyl Wraparound Labels:

1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
3. Provide label 6 inches from cable end.

I. Snap-Around Labels:

1. Secure tight to surface at a location with high visibility and accessibility.
2. Provide label 6 inches from cable end.

J. Self-Adhesive Wraparound Labels:

1. Secure tight to surface at a location with high visibility and accessibility.
2. Provide label 6 inches from cable end.

K. Self-Adhesive Labels:

1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.

L. Snap-Around, Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

M. Cable Ties: General purpose, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations with high visibility. Identify by system and circuit designation.

C. Accessible Fittings for Raceways and Cables within Buildings: Identify covers of each junction and pull box with self-adhesive labels containing wiring system legend.

1. System legends shall be as follows:
   a. Telecommunications.
   b. Access Control
   c. CCTV

D. Faceplates: Label individual faceplates with self-adhesive labels. Place label at top of faceplate. Each faceplate shall be labeled with its individual, sequential designation, numbered clockwise when entering room from primary egress, composed of the following, in the order listed:

1. Wiring closet designation.
2. Colon.
3. Faceplate number.

E. Equipment Room Labeling:

1. Racks, Frames, and Enclosures: Identify front and rear of each with self-adhesive labels.
2. Patch Panels: Label individual rows in each rack, starting at top and working down, with self-adhesive labels. Label individual rows and outlets, starting at to left and working down, with self-adhesive labels.
3. Data Outlets: Label each outlet with a self-adhesive label indicating the following, in the order listed:
   a. Room number being served.
   b. Colon.
   c. Faceplate number.

4. Provide cable schedule per rack, frame and enclosure with origin and destination of each cable including pass-thru locations.

F. Backbone Cables: Label each cable with a vinyl-wraparound label or self-adhesive wraparound label indicating the location of the far or other end of the backbone cable. Patch panel or punch down block where cable is terminated should be labeled identically.

G. Horizontal Cables: Label each cable with a vinyl-wraparound label, snap-around label or self-adhesive wraparound label indicating the following, in the order listed:

1. Room number.
2. Colon.
3. Faceplate number.

H. Instructional Signs: Self-adhesive labels.

1. Apply to exterior of door, cover, or other access.

I. Equipment Identification Labels:

1. Indoor Equipment: Self-adhesive label, Baked-enamel signs, Metal-backed butyrate signs, Laminated-acrylic or melamine-plastic sign.
2. Outdoor Equipment: Laminated-acrylic or melamine-plastic sign.
3. Typical Equipment to Be Labeled:
   a. Communications cabinets.
   b. Uninterruptible power supplies.
   c. Computer room air conditioners.
   d. Fire-alarm and suppression equipment.
   e. Egress points.
   f. Power distribution components.
   g. Access Control Equipment.
   h. CCTV cameras
   i. Displays
   j. Wireless access points (WAP)

END OF SECTION 270553

SECTION 271513 - COMMUNICATIONS COPPER HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Category 6 twisted pair cable.
2. Category 6a twisted pair cable.
3. Twisted pair cable hardware, including plugs and jacks.
4. Cable management system.
5. Cabling identification products.
6. Grounding provisions for twisted pair cable.
7. Source quality control requirements for twisted pair cable.

1.3 DEFINITIONS

A. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

B. EMI: Electromagnetic interference.

C. FTP: Shielded twisted pair.

D. F/FTP: Overall foil screened cable with foil screened twisted pair.

E. F/UTP: Overall foil screened cable with unscreened twisted pair.

F. IDC: Insulation displacement connector.

G. LAN: Local area network.

H. Jack: Also commonly called an "outlet," it is the fixed, female connector.

I. Plug: Also commonly called a "connector," it is the removable, male telecommunications connector.

J. RCDD: Registered Communications Distribution Designer.

K. Screen: A metallic layer, either a foil or braid, placed around a pair or group of conductors.

L. Shield: A metallic layer, either a foil or braid, placed around a pair or group of conductors.

M. S/FTP: Overall braid screened cable with foil screened twisted pair.

N. S/UTP: Overall braid screened cable with unscreened twisted pairs.

O. UTP: Unscreened (unshielded) twisted pair.

1.4 COPPER HORIZONTAL CABLING DESCRIPTION

A. Horizontal cable cabling system shall provide interconnections between Distributor A, Distributor B, or Distributor C, and the equipment outlet, otherwise known as "Cabling Subsystem 1," in the telecommunications cabling system structure. Cabling system consists of horizontal cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for horizontal-to-horizontal cross-connection.

1. TIA-568.1-E requires that a minimum of two equipment outlets be installed for each work area.
2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications equipment outlet.
3. Bridged taps and splices shall not be installed in the horizontal cabling.

B. A work area is approximately 100 sq. ft. and includes the components that extend from the equipment outlets to the station equipment.

C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment or in the horizontal cross-connect.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Reviewed and stamped by an RCDD other than the consultant.

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
3. Cabling administration Drawings and printouts.
4. Wiring diagrams and installation details of telecommunications equipment, to show location and layout of telecommunications equipment, including the following:
    a. Telecommunications rooms plans and elevations.
    b. Telecommunications pathways.
    c. Telecommunications system access points.
    d. Telecommunications grounding system.
    e. Telecommunications conductor drop locations.
    f. Typical telecommunications details.
    g. Mechanical, electrical, and plumbing systems.

C. Twisted pair cable testing plan.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For RCDD, Installer, installation supervisor, and field inspector.

B. Product Certificates: For each type of product.

C. Source quality-control reports.

D. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For splices and connectors to include in maintenance manuals.

B. Record Drawings:

1. Provide Record Drawings which denote as-built information.
2. Include cable routes and outlet locations.
3. Identify Telecommunications and other low-voltage Outlet locations by their sequential number as defined elsewhere in these documents. Numbering, icons and drawing conventions used shall be consistent throughout all documentation provided.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Faceplates: Two of each type.
2. Jacks: Six of each type.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings**,** cabling administration Drawings, and field-testing program development by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of Technician or Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Testing Agency Qualifications: Testing agency must have personnel certified by BICSI on staff.

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test each pair of twisted pair cable for open and short circuits.

1.11 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.12 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA-568.1-E, when tested according to test procedures of this standard.

B. Telecommunications Pathways and Spaces: Comply with TIA-569-E.

C. Grounding: Comply with TIA-607-D.

2.2 GENERAL CABLE CHARACTERISTICS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with the applicable standard and NFPA 70 for the following types:

1. Communications, Non-plenum: Type CMR complying with UL 1666 and ICEA S-103-701.
2. Communications, Non-plenum: Type CMP or Type CMR in listed plenum or riser communications raceway.
3. Communications, Non-plenum: Type CMP or Type CMR in metallic conduit installed according to NFPA 70, Article 300.22, "Wiring in Ducts, Plenums, and Other Air-Handling Spaces."

B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

C. RoHS compliant.

2.3 CATEGORY 6 TWISTED PAIR CABLE

A. Description: Four-pair, balanced-twisted pair cable, with or without internal spline, certified to meet transmission characteristics of Category 6 cable at frequencies up to 250MHz.

B. Manufacturers: CommScope, Belden or equal.

C. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568.2-D for Category 6 cables.

D. Conductors: 100-ohm, 23 AWG solid copper.

E. Shielding/Screening: Unshielded balanced twisted pairs (UTP), Shielded balanced twisted pairs (FTP), Screened balanced twisted pairs (F/UTP) or screened and shielded balanced twisted pairs (F/FTP).

F. Cable Rating: Riser

G. Jacket: White, Gray, Black or Blue thermoplastic. Coordinate color with client.

2.4 CATEGORY 6a TWISTED PAIR CABLE

A. Description: Four-pair, balanced-twisted pair cable, with or without internal spline, certified to meet transmission characteristics of Category 6a cable at frequencies up to 500MHz.

B. Manufacturers: CommScope, Belden or equal.

C. Standard: Comply with TIA-568.2-D for Category 6a cables.

D. Conductors: 100-ohm, 23 AWG solid copper.

E. Shielding/Screening: Unshielded balanced twisted pairs (UTP), Shielded balanced twisted pairs (FTP), Screened balanced twisted pairs (F/UTP) or screened and shielded balanced twisted pairs (F/FTP).

F. Cable Rating: Riser

G. Jacket: White, Gray, Black or Blue thermoplastic. Coordinate color with client.

2.5 TWISTED PAIR CABLE HARDWARE

A. Description: Hardware designed to connect, splice, and terminate twisted pair copper communications cable.

B. Manufacturers: CommScope or equal.

C. Retain “General Requirements for Twisted Pair Cable Hardware” Paragraph below to specify performance requirements for all twisted pair cable hardware specified in this article.

D. General Requirements for Twisted Pair Cable Hardware:

1. Comply with the performance requirements of Category 6 or Category 6a.
2. Comply with TIA-568.2-D, IDC type, with modules designed for punch-down caps or tools.
3. Cables shall be terminated with connecting hardware of same category or higher.

E. Source Limitations: Obtain twisted pair cable hardware from single source from single manufacturer.

F. Patch Panel: (Confirm with owner if required)

G. Modular panels housing numbered jack units with IDC-type connectors at each jack location for permanent termination of pair groups of installed cables.

1. Features:
   a. Universal T568A and T568B wiring labels.
   b. Labeling areas adjacent to conductors.
   c. Replaceable connectors.
   d. 48 ports.

2. Construction: 16-gauge steel and mountable on 19-inch equipment racks.
3. Number of Jacks per Field: One for each four-pair conductor group of indicated cables.

H. Patch Cords: Installer provided as required.

I. Plugs and Plug Assemblies: (Not to be used for UTP horizontal cabling)

1. Male; eight position; color-coded modular telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
2. Standard: Comply with TIA-568.2-D.
3. Marked to indicate transmission performance.

J. Jacks and Jack Assemblies:

1. Female; eight position; modular; fixed telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
2. Designed to snap-in to a patch panel or faceplate.
3. Standard: Comply with TIA-568.2-D.
4. Marked to indicate transmission performance.

K. Faceplate:

1. Two or four port, vertical single gang faceplates designed to mount to single gang wall boxes.
2. Single port, vertical single gang faceplate kit designed to mount to single gang wall boxes.
3. Plastic Faceplate: High-impact plastic. Coordinate color with Division 26 specifications "Wiring Devices."
4. Metal Faceplate: Stainless steel, complying with requirements in Division 26 specifications "Wiring Devices."

5. For use with snap-in jacks accommodating any combination of twisted pair, optical fiber, and coaxial work area cords.
   a. Flush mounting jacks, positioning the cord at a 45-degree angle.
   b. Wiring Type: confirm with client

L. Legend:

1. Machine printed, in the field, using adhesive-tape label.
2. Snap-in, clear-label covers and machine-printed paper inserts.

M. Owner Furnished Equipment:

1. Not applicable

2.6 CABLE MANAGEMENT SYSTEM

A. Description: Computer-based cable management system, with integrated database and graphic capabilities.

B. Document physical characteristics by recording the network, TIA details, and connections between equipment and cable.

C. Information shall be presented in database view**,** schematic plans, or technical drawings.

1. Microsoft Visio Professional or AutoCAD or Revit drawing software shall be used as drawing and schematic plans software.

D. System shall interface with the following testing and recording devices:

1. Direct upload tests from circuit testing instrument into the personal computer.
2. Direct download circuit labeling into labeling printer.

2.7 IDENTIFICATION PRODUCTS

A. Comply with TIA-606-C and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.8 GROUNDING

A. Comply with requirements in Division 27 specifications "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.

B. Comply with TIA-607-C.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test cables on reels according to TIA-568.1-E.

C. Factory test twisted pair cables according to TIA-568.2-D.

D. Cable will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays, within consoles, cabinets, desks, and counters. Conceal raceway and cables, except in unfinished spaces.

1. Comply with requirements for raceways and boxes specified in Division 27 specifications "Pathways for Communications Systems."

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools. Install conductors parallel with or at right angles to sides and back of enclosure.

3.2 INSTALLATION OF PATHWAYS

A. Comply with requirements for demarcation point, cabinets, and racks specified in Division 27 specifications "Communications Equipment Room Fittings."

B. Comply with Division 27 specifications "Pathways for Communications Systems."

C. Comply with Division 27 specifications "Hangers and Supports for Communications Systems."

D. Comply with Division 27 specifications "Cable Trays for Communications Systems."

E. Drawings indicate general arrangement of pathways and fittings.

3.3 INSTALLATION OF TWISTED-PAIR HORIZONTAL CABLES

A. Comply with NECA 1 and NECA/BICSI 568.

B. General Requirements for Cabling:

1. Comply with TIA-568.0-E, TIA-568.1-E, and TIA-568.2-D.
2. Comply with BICSI's "Information Transport Systems Installation Methods Manual (ITSIMM), Ch., "Structured Cabling Systems," "Cable Termination Practices" Section.

3. Do not untwist twisted pair cables more than 1/2 inch from the point of termination to maintain cable geometry.
4. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, prevent straining connections, and prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI Information Transport Systems Installation Methods Manual, Chapter, "Structured Cabling Systems," "Cable Termination Practices" Section. Use lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.
10. In the communications equipment room, install a 10-foot-long service loop on each end of cable.
11. Pulling Cable: Comply with BICSI Information Transport Systems Installation Methods Manual, Ch., "Structured Cabling Systems," "Pulling and Installing Cable" Section. Monitor cable pull tensions.

C. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend twisted pair cabling, not in a wireway or pathway, a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

D. Group connecting hardware for cables into separate logical fields.

E. Separation from EMI Sources:

1. Comply with recommendations from BICSI's "Telecommunications Distribution Methods Manual" and TIA-569-E for separating unshielded copper communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 6 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.

3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 4 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

4. Separation between communications cables in grounded metallic raceways, power lines, and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 6 inches.

3.4 FIRESTOPPING

A. Comply with requirements in Division 07 specifications "Penetration Firestopping."

B. Comply with TIA-569-E, Annex A, "Firestopping."

C. Comply with "Firestopping Systems" Article in BISCI's "Telecommunications Distribution Methods Manual."

3.5 GROUNDING

A. Install grounding according to the "Bonding and Grounding (Earthing)," chapter in BICSI's "Telecommunications Distribution Methods Manual."

B. Comply with TIA-607-D and NECA/BICSI-607.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall, allowing at least a 2-inch clearance behind the grounding bus bar. Connect grounding bus bar to suitable electrical building ground, using a minimum No. 4 AWG grounding electrode conductor.

D. Bond metallic equipment to the grounding bus bar, using not smaller than a No. 6 AWG equipment grounding conductor.

3.6 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA-606-C. Comply with requirements for identification specified in Division 27 specifications "Identification for Communications Systems."

1. Administration Class: Class 1, Class 2, Class 3 or Class 4.
2. Color-code cross-connect fields and apply colors to voice and data service backboards, connections, covers, and labels.

B. Paint and label colors for equipment identification shall comply with TIA-606-C for Class 2, Class 3, Class 4 level of administration**.**

C. Cable Schedule: Install in a prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

D. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.

E. Cable and Wire Identification:

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at the device if wire color is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
4. Label each terminal strip, and screw terminal in each cabinet, rack, or panel.
    a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group, extended from a panel or cabinet to a building-mounted device, with the name and number of a particular device.
    b. Label each unit and field within distribution racks and frames.

5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and -connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

F. Labels shall be preprinted or computer-printed type, with a printing area and font color that contrast with cable jacket color but still comply with TIA-606-C requirements for the following:

1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections.

E. Tests and Inspections:

1. Visually inspect jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA-568.1-E.
2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
3. Test twisted pair cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
    a. Test performance per TIA-568.2-D Permanent Link test configuration and procedures.
        1) Test Transmission Performance of Horizontal Cabling to include the following:
            a) Length
            b) Attenuation (Insertion Loss)
            c) Pair-to-Pair NEXT Loss
            d) PSNEXT Loss
            e) Attenuation-to-Crosstalk Ratio (ACR)
            f) Power-sum ACR (PSACR)
            g) Propagation Delay
            h) Delay Skew
            i) Return Loss
    b. Test instruments shall meet or exceed applicable requirements in TIA-568.2-D. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
    c. Test instrument shall be calibrated to factory standards within one year of test date.
    d. Program test unit to match Net Propagation Velocity (NPV) of the installed cable type.
    e. Where F/UTP cabling is installed, testing shall include Shield Continuity.
    f. Where a Surge Protector is in place as part of the Horizontal Permanent Link, performance testing shall include the Surge Protector as part of the link.

F. The cabling must pass all the specified requirements. Conditional passing test results that are within the measurements accuracy of the test equipment (e.g., “PASS”) are not acceptable.

G. Data for each measurement shall be documented as follows:

1. In the native format of the test instrument.
2. In a summary report to include a list of all fibers and the corresponding attenuation. The summary shall be in Adobe Acrobat (.pdf) format.

H. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

I. End-to-end cabling will be considered defective if it does not pass tests and inspections.

J. Prepare test and inspection reports.

3.8 WARRANTY

A. See Division 01 specifications, GENERAL CONDITIONS, and GENERAL REQUIREMENTS - Guarantee Documents for general requirements.

B. Minimum Warranty period for Structured Cable System sub-systems shall be as follows:

1. Horizontal Copper Permanent Link – 15 years. Warranty shall be direct from manufacturer(s) of cabling and connecting components to Owner.

C. Warranties shall include all labor, material, and travel time.

D. Provide Warranty Certification of the Horizontal Copper Permanent Link from the manufacturer(s) of cabling and connecting components as part of system documentation.

END OF SECTION 271513

SECTION 281500 - ACCESS CONTROL HARDWARE DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. System consists of addition to existing DSX access control system. Install new equipment to comply and function with existing access control system at locations indicated on "T" series drawings. New equipment shall not require software update to existing system. Coordinate any programming with owner. Installer to verify expansion availability of electronics to existing system and include any equipment necessary to provide a complete operational system.

B. Section Includes:

1. Card readers, credential cards and push buttons
2. Request to Exit Sensor
3. Door Contact
4. Security Fasteners
5. Cables
6. Transformers

C. Related Requirements:

1. Division 28 specifications "Access Control System Software and Database Management" for control and monitoring applications, workstations, and interfaces.

1.3 DEFINITIONS

A. Credential: Data assigned to an entity and used to identify that entity.

B. DTS: Digital Termination Service. A microwave-based, line-of-sight communication provided directly to the end user.

C. Identifier: A credential card; keypad personal identification number; or code, biometric characteristic, or other unique identification entered as data into the entry-control database for the purpose of identifying an individual. Where this term is presented with an initial capital letter, this definition applies.

D. Location: A Location on the network having a PC-to-controller communications link, with additional controllers at the Location connected to the PC-to-controller link with a TIA 485-A communications loop. Where this term is presented with an initial capital letter, this definition applies.

E. PC: Personal computer. Applies to the central station, workstations, and file servers.

F. RAS: Remote access services.

G. RF: Radio frequency.

H. ROM: Read-only memory. ROM data are maintained through losses of power.

I. TCP/IP: Transport control protocol/Internet protocol.

J. TWAIN: Technology without an Interesting Name. A programming interface that lets a graphics application, such as an image editing program or desktop publishing program, activate a scanner, frame grabber, or other image-capturing device.

K. WMP: Windows media player.

L. Wiegand: Patented magnetic principle that uses specially treated wires embedded in the credential card.

M. WYSIWYG: What You See Is What You Get. Text and graphics appear on the screen the same as they will in print.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Reference each product to a location on Drawings. Test and evaluation data presented in Product Data shall comply with SIA BIO-01.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Diagrams for cable management system.
2. System labeling schedules, including electronic copy of labeling schedules that are part of the cable and asset identification system of the software specified in Parts 2 and 3.
3. Wiring Diagrams. For power, signal, and control wiring. Show typical wiring schematics including the following:
    a. Workstation outlets, jacks, and jack assemblies.
    b. Patch cords.
    c. Patch panels.
    d. Card readers.
    e. Request to Exit Sensor.
    f. Door Contact.
    g. Electrified Door Hardware.
4. Cable Administration Drawings: As specified in "Identification" Article.
5. Battery and charger calculations for central station, workstations, and controllers.

C. Product Schedules.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For security system to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 specifications "Operation and Maintenance Data," include the following:

1. Hard copies of manufacturer's specification sheets, operating specifications, design guides, user's guides for software and hardware, and PDF files on USB and cloud media of the hard-copy submittal.
2. System installation and setup guides with data forms to plan and record options and setup decisions.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses of all kinds, power and electronic, equal to 10 percent of amount installed for each size used, but no fewer than three units.
2. Card Reader: One spare to be provided.
3. Request to Exit Sensor: One spare to be provided.
4. Door Contact: Two spares to be provided.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

1. Cable installer must have on staff an RCDD certified by BICSI or PSP certified by ASIS.

B. Source Limitations: Obtain central station, workstations, controllers, Identifier readers, and all software through one source from single manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store in temperature- and humidity-controlled environment in original manufacturer's sealed containers. Maintain ambient temperature between 50 and 85 deg F, and not more than 80 percent relative humidity, noncondensing.

B. Open each container; verify contents against packing list; and file copy of packing list, complete with container identification, for inclusion in operation and maintenance data.

C. Mark packing list with the same designations assigned to materials and equipment for recording in the system labeling schedules that are generated by software specified in "Cable and Asset Management Software" Article.

D. Save original manufacturer's containers and packing materials and deliver as directed under provisions covering extra materials.

1.10 PROJECT CONDITIONS

A. Environmental Conditions: System shall be capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

1. Control Station: Rated for continuous operation in ambient conditions of 60 to 85 deg F and a relative humidity of 20 to 80 percent, noncondensing.
2. Indoor, Controlled Environment: NEMA 250, Type 1 enclosure. System components, except the central-station control unit, installed in temperature-controlled indoor environments shall be rated for continuous operation in ambient conditions of 36 to 122 deg F dry bulb and 20 to 90 percent relative humidity, noncondensing.
3. Indoor, Uncontrolled Environment: NEMA 250, Type 3R, Type 4, Type 12 or Type 12K enclosures. System components installed in non-temperature-controlled indoor environments shall be rated for continuous operation in ambient conditions of 0 to 122 deg F dry bulb and 20 to 90 percent relative humidity, noncondensing.
4. Outdoor Environment: NEMA 250, NEMA 250, Type 3, Type 3R, Type 3S, Type 4 or Type 4X enclosures. System components installed in locations exposed to weather shall be rated for continuous operation in ambient conditions of minus 30 to plus 122 deg F dry bulb and 20 to 90 percent relative humidity, condensing. Rate for continuous operation where exposed to rain as specified in NEMA 250, winds up to 85 mph and snow cover up to 24 inches thick.
5. Hazardous Environment: System components located in areas where fire or explosion hazards may exist because of flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers shall be rated, listed, and installed according to NFPA 70.
6. Corrosive Environment: For system components subjected to corrosive fumes, vapors, and wind-driven salt spray in coastal zones, provide NEMA 250, Type 4X or Type 6P enclosures.

PART 2 - PRODUCTS

2.1 OPERATION

A. Security access system hardware shall be compatible with existing access-control and credential-creation functions.

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70, "National Electrical Code."

C. Comply with SIA DC-01 and SIA DC-03 and SIA DC-07.

2.3 CARD READERS, CREDENTIAL CARDS, AND KEYPADS

A. Manufacturer: HID to match existing.

B. Card-Reader Power: Powered from its associated controller, including its standby power source, and shall not dissipate more than 5 W.

C. Response Time: Card reader shall respond to passage requests by generating a signal that is sent to the controller. Response time shall be 800 ms or less, from the time the card reader finishes reading the credential card until a response signal is generated.

D. Enclosure: Suitable for surface, semi-flush, pedestal, or weatherproof mounting. Mounting types shall additionally be suitable for installation in the following locations:

1. Indoors, controlled environment.
2. Indoors, uncontrolled environment.
3. Outdoors, with built-in heaters or other cold-weather equipment to extend the operating temperature range as needed for operation at the site.

E. Touch-Plate and Proximity Readers:

1. Active-detection proximity card readers shall provide power to compatible credential cards through magnetic induction and shall receive and decode a unique identification code number transmitted from the credential card.
2. Passive-detection proximity card readers shall use a swept-frequency, RF field generator to read the resonant frequencies of tuned circuits laminated into compatible credential cards. The resonant frequencies read shall constitute a unique identification code number.
3. The card reader shall read proximity cards in a range from direct contact to at least 6 inches from the reader.

F. Communication Protocol: Compatible with local processor.

G. Touch-Plate and Contactless Card Reader: The reader shall have "flash" download capability to accommodate card format changes. The card reader shall have capability of transmitting data to security control panel and shall comply with ISO/IEC 7816.

H. Card Type: HID (type to be determined)

I. Credential Card Modification: If applicable. Entry-control cards shall be able to be modified by lamination direct print process during the enrollment process without reduction of readability. The design of the credential cards shall allow for the addition of at least one slot or hole to accommodate the attachment of a clip for affixing the credential card to the badge holder used at the site. Specify the standard card size of 2-1/8 by 3-3/8 inches (54 by 85 mm) unless a different size card is needed. If a nonstandard size card is specified, verify that the card size will work with the photo badging system and the card reader specified.

2.4 PUSH-BUTTON SWITCHES – IF APPLICABLE

A. Push-Button Switches: Momentary-contact back-lighted push buttons with stainless steel switch enclosures.

B. Electrical Ratings:

1. Minimum continuous current rating of 10A at 120-V ac or 5A at 240-V ac.
2. Contacts that will make 720 VA at 60A and that will break at 720 VA at 10A.

C. Enclosures: Flush or surface mounting. Push buttons shall be suitable for flush mounting in the switch enclosures.

D. Enclosures shall additionally be suitable for installation in the following locations:

1. Indoors, controlled environment.
2. Indoors, uncontrolled environment.
3. Outdoors.

E. Power: Push-button switches shall be powered from their associated controller, using dc control.

2.5 REQUEST TO EXIT SENSOR

A. Manufacturer: Bosch DS160 or equal.

B. Listed and labeled by a qualified testing agency for compliance with SIA PIR-01 and UL.

C. Description: Sensors detect motion by monitoring infrared wavelengths emitted from a human body within their protected zone and by being insensitive to general thermal variations.

1. Wall-Mounted Unit Maximum Detection Range: 125 percent of indicated distance for individual units and not less than 25 feet. Unit to have adjustable coverage pattern**.**
2. Ceiling-Mounted Unit Pattern Size: 60-inch diameter at floor level.

D. Device Performance:

1. Sensitivity: Adjustable pattern coverage to detect a change in temperature of 2 deg F or less, and standard-intruder movement within sensor's detection patterns at any speed between 0.3 to 7.5 fps across two adjacent segments of detector's field of view.
2. Test Indicator: LED test indicator that is not visible during normal operation. When visible, indicator shall light when sensor detects motion. Locate test enabling switch under sensor housing cover.
3. Remote Test: When initiated by master control unit, start a test sequence for each detector element that simulates motion movement within sensor's detection patterns, causing a door release.

2.6 DOOR CONTACT

A. Manufacturer: Bosch, Flair or equal.

B. Description: Balanced-magnetic switch, complying with UL 634, installed on frame with integral overcurrent device to limit current to 80 percent of switch capacity. Bias magnet and encapsulated reed switch shall resist compromise from introduction of foreign magnetic fields.

C. Flush-Mounted Switches: Unobtrusive and flush with surface of door frame.

D. Operating temperature range: 7.2°C to -95.56°C (-45°F to 140°F)

2.7 SECURITY FASTNERS

A. Operable only by tools produced for use on specific type of fastener by fastener manufacturer or other licensed fabricator. Drive system type, head style, material, and protective coating as required for assembly, installation, and strength. Use stainless steel in all production areas, no exceptions.

B. Drive System Types: Pinned Torx-Plus, pinned Torx or pinned hex (Allen).

C. Socket Flat Countersunk Head Fasteners:

1. Heat-treated alloy steel, ASTM F835.
2. Stainless steel, ASTM F879, Group 1 CW.

D. Socket Button Head Fasteners:

1. Heat-treated alloy steel, ASTM F835.
2. Stainless steel, ASTM F879, Group 1 CW.

E. Socket Head Cap Fasteners:

1. Heat-treated alloy steel, ASTM A574.
2. Stainless steel, ASTM F837, Group 1 CW.

F. Protective Coatings for Heat-Treated Alloy Steel:

1. Zinc chromate, ASTM F1135, Grade 3 or Grade 4, for exterior applications and interior applications where indicated.
2. Zinc phosphate with oil, ASTM F1137, Grade I, or black oxide unless otherwise indicated.

2.8 CABLES

A. General Cable Requirements: Comply with requirements in Division 26 specifications "Low-Voltage Electrical Power Conductors and Cables" and as recommended by system manufacturer for integration requirement.

B. PVC-Jacketed, TIA 232-F.

1. No. 22 AWG, stranded (7x30) tinned copper conductors.
2. Polypropylene insulation.
3. Aluminum foil-polyester tape shield with 100 percent shield coverage.
4. PVC jacket.
5. Conductors are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.

6. Flame Resistance: Comply with UL 1581.

C. Plenum-Rated TIA 232-F Cables:

1. No. 22 AWG, stranded (7x30) tinned copper conductors.
2. PE insulation.
3. Aluminum foil-polyester tape shield with 100 percent shield coverage.
4. Fluorinated ethylene propylene jacket.
5. Conductors are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.
6. Flame Resistance: Comply with NFPA 262.

D. PVC-Jacketed, TIA 485-A Cables:

1. Paired, two pairs, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. NFPA 70 Type: Type CM or Type CMG.
6. Flame Resistance: Comply with UL 1581.

E. Plenum-Rated TIA 485-A Cables:

1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned copper conductors.
2. Fluorinated ethylene propylene insulation.
3. Unshielded.
4. Fluorinated ethylene propylene jacket.
5. NFPA 70 Type: Type CMP
6. Flame Resistance: NFPA 262, Flame Test.

F. LAN Cabling:

1. Comply with requirements in Division 27 specifications "Communications Copper Horizontal Cabling" and or “Communications Copper Backbone Cabling.”

2.9 TRANSFORMERS

A. NFPA 70, Class II control transformers, NRTL listed. Transformers for security access-control system shall not be shared with any other system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.

B. Examine roughing-in for LAN and control cable conduit systems to PCs, controllers, card readers, and other cable-connected devices to verify actual locations of conduit and back boxes before device installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with recommendations in SIA CP-01.

B. Comply with TIA 606-B, "Administration Standard for Commercial Telecommunications Infrastructure."

C. Product Schedules: Obtain detailed product schedules from manufacturer of access-control system or develop product schedules to suit Project. Fill in all data available from Project plans and specifications and publish as Product Schedules for review and approval.

D. In meetings with Architect and Owner, present Product Schedules and review, adjust, and prepare final setup documents. Use approved, final Product Schedules to set up system software.

3.3 CABLING

A. Comply with NECA 1, "Good Workmanship in Electrical Construction."

B. Install cables and wiring according to requirements in Division 26 specifications "Low-Voltage Electrical Power Conductors and Cables."

C. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

D. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental airspaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.

E. Install LAN cables using techniques, practices, and methods that are consistent with Category 5e rating of components and optical fiber rating of components, and that ensure Category 6 and optical fiber performance of completed and linked signal paths, end to end.

F. Boxes and enclosures containing security-system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.

G. Install end-of-line resistors at the field device location and not at the controller or panel location.

3.4 CABLE APPLICATION

A. Comply with TIA 569-D, "Commercial Building Standard for Telecommunications Pathways and Spaces."

B. Cable application requirements are minimum requirements and shall be exceeded if recommended or required by manufacturer of system hardware.

C. TIA 232-F Cabling: Install at a maximum distance of 50 ft. between terminations.

D. TIA 485-A Cabling: Install at a maximum distance of 4000 ft. between terminations.

E. Card Readers and Keypads:

1. Install number of conductor pairs recommended by manufacturer for the functions specified.
2. Unless manufacturer recommends larger conductors, install No. 22 AWG wire if maximum distance from controller to the reader is 250 ft., and install No. 20 AWG wire if maximum distance is 500 ft..
3. For greater distances, install "extender" or "repeater" modules recommended by manufacturer of the controller.
4. Install minimum No. 18 AWG shielded cable to readers and keypads that draw 50 mA or more.

F. Install minimum No. 16 AWG cable from controller to electrically powered locks. Do not exceed 250 ft. between terminations.

G. Install minimum No. 18 AWG ac power wire from transformer to controller, with a maximum distance of 25 ft. between terminations.

3.5 FIRESTOPPING

A. Comply with requirements in Division 07 specifications "Penetration Firestopping."

B. Comply with TIA-569-E, Annex A, "Firestopping."

C. Comply with "Firestopping Systems" Article in BISCI's "Telecommunications Distribution Methods Manual."

3.6 GROUNDING

A. Comply with Division 27 specifications "Grounding and Bonding for Communications Systems."

B. Comply with IEEE 1100, "Recommended Practice for Power and Grounding Electronic Equipment."

C. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

D. Bond shields and drain conductors to ground at only one point in each circuit.

E. Signal Ground:

1. Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
2. Bus: Mount on wall of main equipment room with standoff insulators.
3. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.

3.7 INSTALLATION

A. Install access control modules, card readers and push buttons (if applicable), request to exit sensors, door contacts and cabling to successfully integrate new devices into existing system. See Division 08 specifications for door hardware requirements and installation.

3.8 IDENTIFICATION

A. In addition to requirements in this article, comply with applicable requirements in Division 27 specifications "Identification for Communications Systems" and with TIA 606-B.

B. Using software, develop cable administration drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable, and label cable and jacks, connectors, and terminals to which it connects with the same designation. Use logical and systematic designations for facility's architectural arrangement.

C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

1. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the particular device as shown.
2. Each wire connected to building-mounted devices is not required to be numbered at the device if the color of the wire is consistent with the associated wire connected and numbered within the panel or cabinet.

D. At completion, cable and asset management software shall reflect as-built conditions.

3.9 SYSTEM SOFTWARE AND HARDWARE

A. Develop, install, and test software and hardware, and perform database tests for the complete and proper operation of systems involved. Assign software license to Owner if applicable.

3.10 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use tester approved for type and kind of installed cable. Test for faulty connectors, splices, and terminations. Test according to TIA 568-C.1, "Commercial Building Telecommunications Cabling Standards - Part 1: General Requirements." Link performance for balanced twisted-pair cables must comply with minimum criteria in TIA 568-C.1.
2. Test each circuit and component of each system. Tests shall include, but are not limited to, measurements of power-supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup shall be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.

C. Devices and circuits will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Engage a factory-authorized service representative to supervise and assist with startup service.

1. Complete installation and startup checks according to approved procedures that were developed in "Preparation" Article and with manufacturer's written instructions.
2. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.12 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain security access system. See Division 01 specifications "Demonstration and Training."

B. Develop separate training modules for the following:

1. Computer system administration personnel to manage and repair the LAN and databases and to update and maintain software.
2. Operators who prepare and input credentials to man the control station and workstations and to enroll personnel.
3. Security personnel.
4. Hardware maintenance personnel.

END OF SECTION 281500

SECTION 282000 - VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a video surveillance system consisting of cameras, data transmission wiring, with its associated equipment, setup, testing and training.

B. Related Requirements:

1. Division 27 specifications “Pathways for Communications Systems”.
2. Division 27 specifications “Hangers and Supports for Communications Systems”.
3. Division 27 specifications “Cable Trays for Communications Systems”.
4. Division 27 specifications “Sleeves and Sleeve Seals for Communications Pathways and Cabling”.
5. Division 27 specifications “Identification for Communications Systems”.
6. Division 27 specifications “Communications Copper Backbone Cabling”.
7. Division 27 specifications “Communications Copper Horizontal Cabling”.

1.3 DEFINITIONS

A. IP: Internet protocol.

B. IR: Infrared

C. LAN: Local area network.

D. NTSC: National Television System Committee.

E. TCP: Transmission control protocol - connects hosts on the Internet.

F. UPS: Uninterruptible power supply.

G. WAN: Wide area network.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include dimensions and data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For video surveillance. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
3. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
4. Wiring Diagrams: For power, signal, and control wiring.

C. Design Data: Include an equipment list consisting of every piece of equipment by model number, manufacturer, serial number, location, and date of original installation. Add pretesting record of each piece of equipment, listing name of person testing, date of test, set points of adjustments, name and description of the view of preset positions, description of alarms, and description of unit output responses to an alarm.

1.5 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Data: Certificates, for cameras, camera-supporting equipment, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Field quality-control reports. Provide progress updates for wiring, device installation, coordination with owner and equipment deliveries.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For cameras, power supplies, infrared illuminators, monitors, digital video recorders, switches, software information, and control-station components to include in emergency, operation, and maintenance manuals. See Division 01 specifications "Operation and Maintenance Data," for guidance and requirements.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

1. and a relative humidity of 20 to 80 percent, noncondensing.
2.

3. Hazardous Environment: System components located in areas where fire or explosion hazards may exist because of flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers shall be rated, listed, and installed according to NFPA 70.
4. Security Environment: Camera housing for use in high-risk areas where surveillance equipment may be subject to physical violence.
5. Production areas: Camera housing able to withstand constant exposure to frequent disinfection and cleaning occurrences.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of cameras, equipment related to camera operation, and control-station equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period: A minimum of One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM REQUIREMENTS

A. Video-signal format shall comply with AHD, TVI or H.264 digital formats.

B. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor's entry connection to components.

1. Minimum Protection for Power Connections 120 V and More: Auxiliary panel suppressors complying with requirements in Division 26 specifications "Surge Protection for Low-Voltage Electrical Power Circuits."
2. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Connections: Comply with requirements in Division 26 specifications "Surge Protection for Low-Voltage Electrical Power Circuits" as recommended by manufacturer for type of line being protected.

C. Tamper Protection: Tamper switches on enclosures, control units, pull boxes, junction boxes, cabinets, and other system components shall initiate a tamper-alarm signal when unit is opened or partially disassembled. Control-station, control-unit alarm display shall identify tamper alarms and indicate locations.

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NECA 1.

C. Comply with NFPA 70.

2.3 IP VIDEO SYSTEM

A. Manufacturer: Bosch (owner standard)

B. Description: Cameras, Camera Setup and Software

1. Existing System: Bosch
2. Verify existing version of software is compatible with new devices.
3. Verify existing system is capable of additional cameras.
4. Verify existing video format is compatible with new cameras.
5. Ensure cameras in production areas are capable of environmental requirements.
6. All system interconnect cables, shall be provided for full performance of specified system.
7. Camera setup – Coordinate with client IT department for IP address assignments, field of view and analytics.
8. Verify existing network equipment will function as required with new cameras.

C. Owner Furnished Equipment

1. Not applicable
2.

2.4 SIGNAL TRANSMISSION COMPONENTS

A. Cable: Cat 6, 100-ohm nominal impedance. Comply with requirements in Division 27 specifications “Communications Copper Horizontal Cabling”.

B. Video Surveillance Camera Cable Connectors: RJ-45 type, 8 POS, 8 conductor. Comply with requirements in Division 27 specifications “Communications Copper Horizontal Cabling”.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine pathway elements intended for cables. Check raceways and other elements for compliance with space allocations, installation tolerance, hazards to camera installation, and other conditions affecting installation.

B. Examine roughing-in for LAN, WAN, and IP network before device installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 WIRING

A. All wiring shall comply with requirements in Division 27 specifications “Communications Copper Backbone Cabling” and “Communications Copper Horizontal Cabling”.

B. Wiring Method: Install cables in raceways unless otherwise indicated.

C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

D. Terminations: splices are not permitted in junction, pull, outlet boxes, terminal cabinets or equipment enclosures. Only terminate to dedicated network switches, CAT 6 patch panels, PoE injectors and device ports.

E. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.

3.3 VIDEO SURVEILLANCE SYSTEM INSTALLATION

A. Install cameras level and plumb.

B. Install cameras with 84-inch- minimum clear space below cameras and their mountings. Change type of mounting to achieve required clearance.

C. Set pan unit to suit final camera position and to obtain the field of view required for camera.

1. Coordinate with owner.

D. Install power supplies and other auxiliary components at IT rooms unless otherwise indicated.

E. Avoid ground loops by making ground connections only at the IT rooms.

F. Identify system components, wiring, cabling, and terminals according to Division 27 specifications "Identification for Communications Systems."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Tests and Inspections:

1. Inspection: Verify that all system components are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.
2. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video-surveillance equipment for acceptance and operational testing as follows:
   a. Prepare equipment list described in "Informational Submittals" Article.
   b. Verify operation of auto-iris lenses.
   c. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.

d. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object 25 to 50 feet away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
e. Set and name all preset positions; consult Owner's personnel.
f. Set sensitivity of motion detection.
g. Connect and verify responses to analytics.
h. Verify operation to remote station equipment.

3. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 7 days. Provide a minimum of 10 days' notice of test schedule.
4. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.

D. Video surveillance system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 ADJUSTING

A. Occupancy Adjustments: When requested within 6 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to installation site during other-than-normal occupancy hours for this purpose. Tasks shall include, but are not limited to, the following:

1. Check cable connections.
2. Check proper operation of cameras and lenses. Verify operation of auto-iris lenses and adjust back-focus as needed.
3. Adjust all preset positions; consult Owner's personnel.
4. Recommend changes to cameras and associated equipment to improve Owner's use of video surveillance system.
5. Provide a written report of adjustments and recommendations to owner and general contractor.

3.6 CLEANING

A. Clean installed items using methods and materials recommended in writing by manufacturer.

B. Clean video-surveillance-system components, including camera-housing windows, lenses, and monitor screens.

3.7 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain video-surveillance equipment.

END OF SECTION 282000

SECTION 283100 - FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Contract Drawings: The Fire Alarm System Drawings included with these specifications are utilized to illustrate the general locations of the new, existing, demo system components and system boundaries of the fire alarm system. Through delegated design the fire alarm contractor provides detailed design and coordination of all system components for a compliant, acceptable, working, fire alarm system.

1.2 SUMMARY

A. Section Includes:

1. Intelligent Addressable Fire Alarm Control Panel
2. Fire Alarm Annunciator Panel
3. Central Monitoring
4. Notification Appliance Power Supplies
5. Speaker Amplifiers
6. Addressable Initiating Devices
7. Audio Visual Notification Appliances
8. Conductors
9. Raceways

B. Related Requirements

1. Related Specification Section Requirements:
   a. Section 260519 – Low-Voltage Electrical Power Conductors and Cables
   b. Section 260529 – Hangers and Supports for Electrical Systems
   c. Section 260533.13 – Raceways and Boxes for Electrical Systems
   d. Section 260533.16 - Boxes and Covers for Electrical Systems
   e. Section 260553 – Identification for Electrical Systems

2. Code Requirements: The requirements in this specification section are based on the requirements of the 2022 California Building Code, 2022 California Mechanical Code, and the 2022 California Fire Code, Local, State, and Federal requirements and amendments. Any additional details of the building code relating to the installation of the design identified in these specifications shall become a part of this contract. If the Contractor discovers conflicts between these specifications and the building code, they shall be brought to the attention of the Engineer prior to any deviations from Contract requirements.
3. Fire alarm system design, layout, materials, manufacture, installation, examination, testing, inspection, stamping certifications, and documentation shall conform to applicable portions of the latest issue of the following adopted codes, standards, and all addenda thereto.

a. NFPA 70 – National Electrical Code
b. NFPA 72 – National Fire Alarm Code

4. These specifications are based upon the standards and codes in force at the time of issue of these documents. Any conflict between referenced standards shall be referred to the Engineer who will determine which standard shall govern. All correspondence requiring a decision by the Authority shall be directed through the Engineer for resolution. The requirements of these specifications and associated drawings take precedence over the minimum requirements of the Codes and Standards listed above.

C. Scope: The Contractor shall layout, size, install and test all portions of the new emergency voice notification fire alarm components installed throughout the work area for the new Membrane Structure and Canopy at the San Luis Obispo Airport Terminal Building. The existing fire alarm system is to be modified as required to complete all work associated with the new building addition and modification of existing building areas. The major items of the scope of work include, but are not limited to the following:

1. Provide and install new emergency voice notification fire alarm system notification appliance speakers, speakers/strobes, conductors, conductor supports, conduit, fittings, fasteners, and all other required components to ensure compliance with all regulations.
2. Layout, provide, and install the fire alarm system components throughout the building as noted on the Contract Documents. Make detailed design adjustments to ensure the fire alarm system is installed to prevent conflicts with other trade system components. Review all contract documents of other trades to ensure complete coordination of the fire alarm system.
3. Details concerning work required for the project follows in the specifications and are shown on the Contract Drawings.

D. Performance Requirements:

1. Delegated Design: Design the fire alarm system, including comprehensive engineering analysis and drawing review by an FPE, using performance requirements and design criteria indicated in the contract documents and listed below. The fire alarm contractor FPE shall seal the fire alarm shop drawings. Fire alarm shop drawings may be prepared under FPE supervision by a Fire Alarm System Designer.
2. Fire Alarm Audibility must achieve an ambient sound pressure level throughout areas installed with notification appliances of 80 decibels.
3. Fire Alarm Intelligibility must be designed to achieve an AHJ acceptable level as identified in NFPA 72.
4. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, and NFPA 72 by a qualified testing agency, and marked for intended location and application.
5. Fire alarm equipment specialties, accessories, installation, and testing to comply with NFPA 70 and NFPA 72.
6. Coordination Drawings: Fire alarm system plans and sections, or Building Information Model (BIM), drawn to scale, showing the items described in this Section and coordinated with all building trades.

1.3 DEFINITIONS

A. Fire Protection Engineer (FPE): A registered professional Engineer (PE), who has passed the National Council of Examiners for Engineering and Surveys (NCEES) written examination in fire protection engineering.

B. Fire Alarm System Designer: A Level III Technician by National Institute for Certification in Engineering and Technologies (NICET) for Fire Alarm Systems.

1.4 ACTION SUBMITTALS

A. Delegated-Design Submittals: The Contractor shall submit the documents electronically, for review, to the Engineer prior to the start of fabrication or installation. The Contractor shall upload the submittal to the Engineer's FTP site and send email notification of the upload to the Engineer. The submittal shall include required information for all work included in this section and referenced specifications including General Conditions and Division 01 Specifications. Documents shall be fully completed and certified by the Contractor as to the compliance of the information contained thereon with the requirements of the Contract Documents. Incomplete submittals will not be reviewed. Complete submittals will be reviewed by the Engineer and processed as specified in Division 1. The Engineer's review will be for general conformity to the specified requirements and is not intended to constitute detailed review or approval of content. Documents stamped NO EXCEPTION TAKEN do not relieve the Contractor from any contract requirements.

1. All drawings shall be prepared with computer drafting software. Drawings and data shall be in sufficient detail to indicate the kind, size, arrangement, and operation of component devices; the external connections, anchorages, and supports required; and dimensions needed for the installation and correlation with other equipment. All drawings shall be to a standard architectural scale which shall be noted on the drawings (including Graphic Representation). Drawing size shall not be less than 30 inches by 42 inches (B1) or greater than 34 inches by 44 inches (A0).
2. All Equipment and Material Data Sheets shall be submitted as a single PDF document. The document shall include bookmarks for each product submitted. Calculations shall be submitted as individual PDF files. Drawings shall be submitted as individual full-size PDF files. A separate transmittal PDF file shall be included. The drawings and calculations shall have a certification sheet bearing the NICET designer certification or the seal of the Contractor's registered professional engineer. All file names shall describe the file content. The transmittal shall also include the specification title, the specification number, and the Subcontractor's name.
    a. Fire Alarm Shop Drawings: Shop drawings shall show all system components and information necessary for the complete installation. The drawings shall be plotted in a standard architectural scale. The drawings shall include the following items:
        1) Name of Owner and occupant
        2) Specification title and number.
        3) Contractor's name and address
        4) Location, including street address.
        5) Point of compass.
        6) A graphic representation of the scale used
        7) Location of partitions.
        8) Location of fire rated barriers or walls and smoke barriers.

9) Locations of lights, diffusers, or other equipment, near the fire alarm system components
10) Room and area descriptions
11) Locations of the system's primary power disconnecting means
12) System riser locations
13) System riser diagram including all devices and equipment connected to the fire alarm control panel
14) Wiring diagrams for each fire alarm system component
15) Type and number of components/devices on each circuit, on each floor or level
16) Type and number of conductors and conduit (if used) for each circuit
17) Identification of any ceiling over 10 ft in height where automatic fire detection is being proposed
18) Where known, acoustic properties of spaces
19) Pathway class designations in accordance with NFPA 72 including the location of any end of line supervisory or power devices that are required by the pathway class
20) Pathway survivability level designation in accordance with NFPA 72
21) Sequence of operation in input/output matrix
22) Battery capacity and safety margin calculations
23) Voltage drop calculations for notification appliance circuits
24) Mounting height elevation for wall mounted devices and appliances
25) Where occupant notification is required, minimum sound pressure levels that must be produced by the audible notification appliances in applicable covered areas
26) Location of alarm notification appliances, including candela ratings for visual alarm notification appliances
27) Pathway diagrams between the control unit and shared communications equipment within the protected premises
28) Equipment and Material Data Sheets: Equipment data sheets shall be submitted for all equipment and devices used in the systems. If options are listed on the data sheets, the specific option for the project shall be clearly marked. The data sheet submittal shall include, but not be limited to the following:
29) Control Panel
30) Digital Alarm Communicator
31) Radio Transmitter
32) Annunciator Panel
33) Notification Appliances
34) Initiating Devices
35) Notification Appliance Power Supply Panel
36) Amplifier Panel
37) Handset Microphone
38) Conductors
39) Conductor Supports
40) Conduit
41) Junction Boxes
42) Fasteners
43) All signs and materials as required by NFPA 70 and NFPA 72.
44) Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

b. Fire Alarm System Battery Calculations: Battery calculations shall be provided for all fire alarm control panels, amplifiers, and notification appliance power supplies. These calculations shall clearly illustrate both the Standby and Alarm loads, due to the various field devices and panel components / modules. The battery capacity shall be calculated to provide 24 hours of system operation in standby plus 15 minutes of operation in alarm. Final results shall indicate both the minimum battery capacity required and the capacity actually provided. A 25% additional battery capacity shall be provided as a correction factor to ensure the battery can meet its current demand at the end of service life. Calculations must be tabulated and submitted in a spreadsheet format and must clearly indicate the following:
   1) Complete list of all devices
   2) Alarm Current Draw for each device and circuit board
   3) These calculations should mathematically prove that all equipment on the circuit will receive acceptable power.

c. Fire Alarm System Amplifier Calculations: Provide amplifier calculations to indicate total watts, decibel loss, and remaining spare capacity. Calculations must be tabulated and submitted in a spreadsheet format. Spare capacity must not be less than 20 percent of the total capacity for each amplifier.

d. Fire Alarm System Voltage Drop Calculation: Calculations shall be provided for all Notification Appliance Circuits (NAC) in the building. Using 20.4 VDC as starting voltage, perform a voltage drop calculation for circuits containing device and/or appliances remote from the power sources. Calculations must be tabulated and submitted in a spreadsheet format and must clearly indicate the following:
   1) The name of the circuit
   2) Point of origin of the circuit
   3) Complete list of all devices served by the circuit, including location and type of each device.
   4) Alarm Current Draw for each device, at the applied voltage.
   5) Applied Voltage (Based on anticipated battery voltage after specified stand-by & alarm operation).
   6) Acceptable Operating Voltage for each type of device on circuit.
   7) Calculated Voltage at each device on circuit.
   8) These calculations should mathematically prove that all Notification Appliances on the circuit will receive acceptable power.

e. Written Test Plan: A written test plan shall be provided as required by NFPA 72 Chapter 14 Inspection Testing and Maintenance.
   1) The written test plan shall include a summary of test procedures for pre-acceptance and acceptance testing of the complete fire alarm system.
   2) The written test plan shall include all equipment required to perform acceptance testing and calibration procedures and certificates for each piece of equipment that will be utilized during the test.
   3) The written test plan shall include a tabulated matrix of each system component to document test results meeting acceptance test criteria to ensure each device in the system is tested.
   4) The written test plan shall include tabulated criteria to document test results for sound pressure readings throughout each tested space.
   5) The written test plan shall include tabulated criteria to document test results for system intelligibility measurements.

f. Fire alarm shop drawings and calculations shall be signed and sealed by the Contractor FPE.

B. Submittal Disposition

1. The reviewed documents will be returned, in one of the following ways.
   a. No Exception Taken
   b. Implement Exceptions Noted
   c. Revise and Resubmit
   d. Rejected, Resubmit
      1) When the documents are returned marked NO EXCEPTIONS TAKEN, the Contractor is released to being fabrication and installation.
      2) When the documents are returned marked IMPLEMENT EXCEPTIONS NOTED, the Contractor shall make the noted changes and is released to begin fabrication and installation. The changes do not need to be resubmitted until the Record Document markups are submitted. Record Document markups shall have the revisions clouded.
      3) When the documents are returned marked REVISE AND RESUBMIT, the basic design is accepted, however, the Contractor is not released to fabricate or begin installation. A complete resubmittal is required (all documents) unless specifically noted otherwise. All revisions shall be clouded. The NICET Certification or Engineer's seal or third-party review letter is required on resubmittal.
      4) When the documents are returned REJECTED, RESUBMIT, the Contractor shall redesign based on the comments and resubmit. All revisions shall be clouded. The NICET Certification or Engineer's seal or third-party review letter is required on the resubmittal.
      5) Resubmittals will not be reviewed without a correction or response for each review comment (clouded).

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Qualifications: Submit the name and documentation of certification of the qualified individuals no later than 14 days after the Notice to Proceed and prior to the submittal of the fire alarm system drawings and fire alarm system calculations.

1. Fire Protection Engineer: Qualifications of the Fire Protection Engineer, with license number, shall be submitted to and approved by architect/engineer prior to submission of the shop drawings. For the purposes of these specifications, the FPE shall have the following qualifications:
   a. The FPE shall be a registered Professional Engineer (PE), who has passed the National Council of Examiners for Engineering and Surveys (NCEES) written examination in fire protection engineering.

2. Fire Alarm System Designer: The fire alarm system designer must be certified as a minimum Level III Technician by National Institute for Certification in Engineering and Technologies (NICET) for Alarm System.

1.6 CLOSEOUT SUBMITTALS

A. Operations and Maintenance Manual: The installation, Operation, and Maintenance Manual sections shall be submitted for final review with the red line record drawings. Final copies of

revised Installation, Operation, and Maintenance Manual section (with all drawings) are required within three (3) weeks after the final acceptance test.

B. Record Drawings and Acceptance Test Certificates:

1. Marked-up Shop Drawings (red-lines) and Record Drawings shall be submitted to the Engineer and Owner. Red-lines shall be submitted prior to the acceptance test. Each phases Record Drawings are required to be submitted prior to the request for the test for the next phase. Record drawings are required to be submitted to the Engineer within two (2) weeks after the acceptance test.
2. Acceptance Test Certificates: All acceptance test certificates must be submitted with the Record Drawings.
3. In addition to the Division 01 Specifications the following must be provided. After acceptance of all documents, one hard copy set of drawings shall be rolled, placed in a PVC pipe and mounted securely adjacent to the fire sprinkler riser(s). A CD or DVD shall accompany the hard copy. Drawings shall be included as individual full-size PDF files and individual bound CAD files. A copy of the CD or DVD shall be forwarded to the Engineer.

1.7 PROJECT CONDITIONS

A. Existing System Equipment: A portion of the existing building is protected with a fire alarm system and occupant notification. Modify the existing fire alarm system to expand circuits from the fire alarm control panel to the new membrane structure addition and canopy. Reconfigure circuits, relocate and reinstall equipment as required and indicated on the Contract Documents for phased construction.

B. Interruption of Existing Fire Alarm System: Do not interrupt the existing fire alarm system unless permitted under the following conditions and then only after arranging to provide temporary fire watch according to requirements indicated:

1. Notify Owner no fewer than 14 calendar, or 10 business days in advance of proposed interruption of the fire alarm system.
2. Do not proceed with interruption of the fire alarm system without the Owner's written permission.

1.8 SEQUENCING AND SCHEDULING

A. System design and installation shall be sequenced with the construction schedule.

B. Existing Fire Alarm System: The existing fire alarm system shall remain operational as required to prevent and reduce system impairments during the project.

C. Equipment Removal: The existing fire alarm system components that will be demolished or deconstructed shall be sequenced with the construction schedule to prevent and reduce system impairments during the project.

D. Delivery Storage and Handling: All fire alarm equipment and materials shall be delivered to the project and stored in a secured location protected from the elements within a conditioned construction debris free area.

1.9 WARRANTY

A. Provide warranty in accordance with Division 01.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Siemens Industry, Inc.; Fire Safety Division.

2.2 FIRE ALARM CONTROL PANEL

A. Fire Alarm Control Panel: Existing to remain.

2.3 FIRE ALARM ANNUNCIATOR PANEL

A. Fire Alarm Graphic Annunciator Panel: The existing fire alarm graphic annunciator panel is existing to be deconstructed, reconfigured for the new building addition, and reinstalled.

2.4 FIRE ALARM NOTIFICATION APPLIANCE POWER SUPPLY PANEL

A. Fire Alarm Notification Appliance Power Supply Panel: Existing to remain.

2.5 FIRE ALARM AMPLIFER PANEL

A. Fire Alarm Amplifier Panel: Existing to remain.

2.6 FIRE ALARM RADIO TRANSMITTER

A. Radio Transmitter: Existing to remain.

2.7 FIRE ALARM CONDUCTORS

A. Fire Alarm Conductors: All wire and cable associated with this system shall be as required by the equipment manufacturer. All cable shall be installed as per NFPA 70 Article 760 and shall be power-limited plenum-rated, FPLP, type.

1. All cables and wires #14 AWG and larger shall be stranded.

2. Fire alarm wiring shall be held in place at the device box, by means of a two-screw connector, (do not use squeeze or crimp type connectors).
3. All wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, disarrangement of any components, any open circuits or grounds in the system, an audible and visual trouble signal shall be activated until the system is restored to normal.
4. All conductors shall be color-coded. Coding shall be consistent throughout the facility. Green wire shall be used only for equipment ground.
5. Speaker wiring shall be minimum #18 AWG twisted-shielded cable, per manufacturers recommendations, and detailed design calculations.
6. Strobe wiring shall be minimum #14 AWG minimum, per manufacturers recommendations, and detailed design calculations.
7. All conductors shall be installed in conduit.

2.8 FIRE ALARM NOTIFICATION APPLIANCES

A. Speakers: Provide in accordance with the manufacturer requirements NFPA 70 and NFPA 72.

1. UL Listed (UL 1480) or FM Approved for Fire Protection Service
2. Speakers must produce a sound rating of at least 85 dBA at 3.1 meters or 10 feet.
3. Speakers must be multi-tap wattage and multi-voltage of either 25V or 70.7V.
4. Speakers must be high-fidelity high efficiency with a frequency of 400Hz - 4kHz (UL) and 200 Hz-15 kHz.
5. Appliance Cover Color: White
6. Identification: “ALERT” in red text
7. Watts: Multi-watt field selectable from 1/4 watt to 2 watt or 1/8 watt to 8 watt.
8. Multi-watt speakers up to 8 watts shall be “Wheelock S8 Ceiling Mounted Speaker” or equivalent as approved by the Engineer. Speakers suspended and installed in a pendent position must have a speaker backbox installed, “Wheelock CBB-8” or equivalent as approved by the Engineer.
9. Mounting: Surface mount and pendent mount supported by canopy columns and membrane structure frame. Provide supplemental support such as Unistrut as required for installation.
10. Exterior Installation: Strobes located in exterior locations or other types of environments not typical to a normally occupiable interior area must be weatherproof type.
11. Speakers used in exterior locations must be specifically listed or approved for outdoor use.

B. Strobes: Provide in accordance with the manufacturer requirements NFPA 70 and NFPA 72.

1. Visual notification appliances must conform to the applicable requirements of UL 1638, UL 1971 and conform to the Architectural Barriers Act (ABA).
2. Lens Color: Clear
3. Appliance Cover Color: White
4. Visual Indicator: Xenon Tube or Light Emitting Diode
5. Voltage: 24V
6. Identification: “ALERT” in red text
7. Candela Rating: Multi-candela field selectable from 15cd to 115cd
8. Synchronization: All visible notification appliances shall be synchronized. Equipment shall be provided as required to ensure all strobes are synchronized.

9. Mounting: Surface mount and pendent mount supported by canopy columns and membrane structure frame. Provide supplemental support such as Unistrut as required for installation.
10. Exterior Installation: Strobes located in exterior locations or other types of environments not typical to a normally occupiable interior area must be weatherproof type.

C. Speaker/Strobe: Provide in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. UL Listed or FM Approved for Fire Protection Service
2. Speakers must produce a minimum sound rating of at least 85 dBA at 3.1 meters10 feet.
3. Speakers must be multi-tap wattage and multi-voltage of either 25V or 70.7V.
4. Speakers must be high-fidelity high efficiency with a frequency of 400Hz - 4kHz (UL) and 200 Hz - 15 kHz.
5. Lens Color: Clear
6. Appliance Cover Color: White
7. Identification: “ALERT” in red text
8. Watts: Multi-watt field selectable from 1/4 watt to 2 watt or 1/8 watt to 8 watt.
9. Multi-watt speakers up to 8 watt shall be “Wheelock S8 Ceiling Mounted Speaker” or equivalent as approved by the Engineer. Speakers suspended and installed in a pendent position must have a speaker backbox installed, “Wheelock CBB-8” or equivalent as approved by the Engineer.
10. Candela Rating: Multi-candela field selectable from 15cd to 115cd
11. Synchronization: All visible notification appliances shall be synchronized. Equipment shall be provided as required to ensure all strobes are synchronized.
12. Mounting: Surface mount and pendent mount supported by canopy columns and membrane structure frame. Provide supplemental support such as Unistrut as required for installation.
13. Exterior Installation: Strobes located in exterior locations or other types of environments not typical to a normally occupiable interior area must be weatherproof type.
14. Speakers used in exterior locations must be specifically listed or approved for outdoor use.

2.9 FIRE ALARM INITIATING DEVICES:

A. Control Relay Module: Provide in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. The system component must be UL Listed or FM Approved.
2. The system component must be an addressable device and compatible component of the fire alarm system.

B. Monitor Module: Provide in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. The system component must be UL Listed or FM Approved.
2. The system component must be an addressable device and compatible component of the fire alarm system.

C. Photoelectric Smoke Detector: Provide in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. The system component must be UL Listed or FM Approved.
2. The system component must be a device addressable and compatible component of the fire alarm system.
3. Device shall have a visible indication of detector activation.

D. Manual Pull Station: Provide in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. The system component must be UL Listed or FM Approved.
2. The system component must be an addressable and compatible component of the fire alarm system.

2.10 HANGERS AND HANGER FASTENERS

A. Hangers, Conductor Supports, and Hanger Fasteners: Provide in accordance with the manufacturer requirements NFPA 70 and NFPA 72.

1. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits.

2.11 SPARE EQUIPMENT

A. Spare Equipment: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. A minimum ten percent of the total quantity of each type of initiating device and notification appliance shall be provided as spare parts to the Owner. Not less than one (1) of each type of initiating device shall be provided to the Owner if calculated that two (2) of each type of notification appliance.

PART 3 - EXECUTION

3.1 GENERAL

A. This section covers the installation and the installation material requirements for the fire alarm system.

B. Products and Materials: Unless specifically provided otherwise in each case, all products and materials furnished for permanent installation in the work shall conform to the applicable standard specifications and shall be new, unused, and undamaged.

C. All products and materials furnished for the incorporation into the work shall be asbestos free.

D. Personnel: The Installation Supervisor shall be on the job site during the entire installation. The Supervisor shall have all contract documents on site at all times. The Supervisor shall also have

a copy of all submittals (shop drawings and all other documentation). The Supervisor shall be responsible for daily updating of the shop drawings and other data to reflect the actual installation (red-lines). These drawings shall be made available to the Engineer for review at any time.

E. Workmanship: Details of erection work not covered herein shall conform to the accepted good engineering practice the Contract Drawings, applicable nationally recognized codes, and all applicable state and local codes.

F. All defects in erection shall be corrected to the satisfaction of the Owner. The dismantling and reassembly or equipment to remove defective parts, replace parts, or make adjustments shall be included as part of the work under these specifications.

G. All work areas shall be cleaned daily prior to the end of the work shift of construction debris. All work areas and associated equipment and materials shall be organized to prevent trip hazards and maintain a clear means of egress from the building and work area exits.

H. Construction Phasing: Construction phasing shall be coordinated with the General contractor and be acceptable to the Engineer. Reference Contract Documents sheet set for additional information on construction phasing.

I. Perform system testing in accordance with NFPA 72.

3.2 EQUIPMENT LOCATIONS AND DETAILS OF INSTALLATION

3.3 FIRE ALARM CONTROL PANEL

A. The existing fire alarm control panel is existing to remain and located in SECURITY 114.

3.4 FIRE ALARM GRAPHIC ANNUNCIATOR PANEL

A. Install in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. As shown on the plans install the fire alarm annunciator panel in the general location and configuration.
2. Mount control panels such that all visual indicators and controls are located accessible to building personnel.

3.5 FIRE ALARM CONDUCTORS

A. Install in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. All conductors (wiring) shall be completely supervised. In the event of a primary power failure, disconnected standby battery, disarrangement of any components, any open

circuits or grounds in the system, an audible and visual trouble signal shall be activated until the system is restored to normal.

2. Pathway Survivability and Class Designation: Fire Alarm Conductors shall be installed with the pathway survivability and class designation as indicated below.
   a. Pathway Survivability and Class Designation:
      1) Signaling Line Circuit (SLC):
      2) Pathway Survivability: Level 0
      3) Pathway Class Designation: Class B
   b. Notification Appliance Circuit (NAC):
      1) Pathway Survivability: Level 0
      2) Pathway Class Designation: Class B
   c. Initiating Device Circuit (IDC)
      1) Pathway Survivability: Level 0
      2) Pathway Class Designation: Class B

3. Fire alarm wiring/cabling shall be provided by the Contractor in accordance with the manufacturer's recommendations and pursuant to National Fire Codes.
4. Wiring shall be installed in conduit from device to above accessible ceilings. All wiring withing mechanical, electrical, or telecommunications rooms shall be installed in conduit. Exposed plenum-rated cable (FPLP) shall be used above accessible ceilings supported every 4 feet or run in cable trays (if applicable) maintaining a minimum of 5-inches clearance from all lighting ballasts.
5. Fire alarm cabling shall not be installed in the same bridle rings or cable trays designated for the cabling of other systems. All junction boxes shall be painted red with SLC and NAC circuits identified on cover.
6. No wiring other than that directly associated with fire alarm detection, alarm or auxiliary fire protection functions shall be in fire alarm conduits. Wiring splices shall be avoided to the extent possible, and if needed, they shall be made only in junction boxes. Transposing or changing color coding of wires shall not be permitted. All conductors in conduit containing more than one wire shall be labeled on each end, in all junction boxes, and at each device with "E-Z Markers" or equivalent. Conductors in cabinets shall be carefully formed and harnessed so that each drops off directly opposite to its terminal. Cabinet terminals shall be numbered and coded, and no unterminated conductors are permitted in cabinets or control panels. All controls, function switches, etc. shall be clearly labeled on all equipment panels.
7. Wiring shall be roughed-in to terminate at system components with an excess of 3 feet to account for minor modifications in the final installation. Wiring shall be cut down to length to make connection within the junction box or panel during final installation of system components.

3.6 FIRE ALARM NOTIFICATION APPLIANCES

A. Install in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. Install wall-mounted notification appliances 80 inches to 96 inches, as measured to the center of the lens, above the finish floor. No devices protruding 4 inches or more shall be installed lower than 80 inches. If these requirements are not achievable, consult with the Engineer before installation. All wall-mounted notification appliances shall be mounted at the same height throughout the facility.

2. Notification appliances must be installed on the ceilings only where indicated, or where approved in writing by the Engineer.
3. For surface mounting, use manufacture-supplied back boxes and trim plates, which shall be painted White, and shall contain no visible conduit knockouts. Mark each device with its circuit number.

3.7 FIRE ALARM INITIATING DEVICES

A. Control Relay Module: Install in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below as applicable.

B. Monitor Module: Install in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below as applicable.

C. Photoelectric Smoke Detector: Install in accordance with the manufacturer requirements NFPA 70, NFPA 72 and the criteria listed below.

1. Surface mounted detectors shall be installed using back boxes equal to the base's size. Standard octagon and square boxes are not acceptable.
2. Detectors should be located on the highest part of a smooth ceiling so that the edge of the detector is no closer than 4 inches from a wall.
3. If it is necessary to mount a detector upon a wall, the top of the detector (the sensing chamber portion of the device) shall be located no closer than 4 inches from the ceiling and no further away than 12 inches.
4. Smoke detectors should be installed not located closer than 3 feet from air supply diffusers which could dilute smoke before it reaches the detector. No detectors shall be installed in direct airflow.

D. Manual Pull Station: Detector: Install in accordance with the manufacturer requirements NFPA 70, NFPA 72, and the criteria listed below.

1. The operable part of the manual stations shall be installed not less than 42 inches and not more than 48 inches above finished floor. All Manual Stations shall be in unobstructed locations. Mark the unit's address on the inside and outside of housing.
2. All manual pull stations shall be installed at the same height throughout the facility.
3. For surface mounting, use manufacture-supplied back boxes and trim plates. Back boxes shall be painted and shall contain no visible conduit knock-outs. Mark each device with its loop and address.
4. During the installation of the new fire alarm systems, new pull stations should be covered or identified as not being operable so building occupants will not be confused as to which fire alarm pull station should be pulled during an alarm condition. Likewise, after the new system is installed, tested and accepted, the existing pull stations should be identified as not being operable (or permanently removed as soon as possible).
5. Install the pull station cover for false alarms.

3.8 IDENTIFICATION

A. Install all required equipment identification in accordance with the contract documents and requirements of NFPA 72, and the criteria listed below.

1. Labeling requirements:
   a. Label Color: Label shall consist of black writing on white or clear background.
   b. Label Text: All labels shall be permanent, and be machine generated. NO HANDWRITTEN OR NON-PERMANENT LABELS SHALL BE ALLOWED. Submit a sample for approval before using any labeling schemes.
   c. Label Size: Label size shall be appropriate for the conductor or cable size(s) and design. All labels to be used shall be self-laminating, white/transparent vinyl and be wrapped around the cable (sheath). Flag type labels are not allowed. The labels shall be of adequate size to accommodate the circumference of the cable being labeled and properly self-laminate over the full extent of the printed area of the label. Label shall be visible and readable from the floor, 3/16" minimum character size (¼" is recommended).

2. Component Labeling:
   a. Initiating devices
   b. Notification appliances
   c. All audio-visual devices shall be labeled by each circuit and the order of the device on that circuit such as "Circuit No. 2, strobe No. 05 of 10".
   d. Manual pull stations
   e. Label shall be placed on the top of the device
   f. Circuits
   g. All circuits must be labeled with the name of circuit and the area being served by the circuit.
   h. Wire/cable splices in junction boxes shall be labeled indicating where the wire/cable is coming from and where it is going.
   i. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 - Identification for Electrical Systems.

3.9 SYSTEM TESTS

A. General: This sub-section covers testing of the fire alarm system furnished, modified, and installed under these specifications. All defects discovered by testing shall be corrected and the systems retested.

1. Test Requirements: The following are the minimum tests to be performed for each type of system. All labor and equipment for testing shall be provided by the Contractor. Calibrated equipment shall be used for all testing. Pre-testing shall include all items listed below.
   a. Before proceeding with any testing, all persons, facilities and building occupants who receive alarms or trouble signals shall be notified by the contractor to prevent unnecessary response or building occupant distress. At the conclusion of testing, those previously notified shall be notified that testing has been concluded.
   b. The manufacturer's authorized representative shall provide on-site supervision of installation of the complete fire alarm system installation, perform a complete functional test of the system, and submit a written report to the Contractor attesting to the proper operation of the completed system prior to final inspection.

2. Pre-Tests: The Contractor shall notify the Engineer in writing of the proposed pre-test date at least two weeks in advance. Test date and time are subject to the approval of the

Engineer. The Contractor shall completely pre-test the system after installation is complete and prior to the final acceptance test. The Contractor shall provide the Owner and the Engineer with a "System Record of Completion" for the fire protection systems installed herein, in accordance with NFPA 72 at least 48 hours before the final acceptance test.

a. Contractor shall pre-test every device in the system before the system is considered ready for final inspection.
b. Audibility testing shall use certified calibrated equipment.
c. Intelligibility testing shall you manufacturer compatible calibrated equipment
d. The completed and pre-tested fire alarm system shall be fully tested in accordance with NFPA 72 by the Contractor in the presence of the Engineer, Owner's representative, and the local Fire Marshal.
e. The Engineer or his authorized representative may suspend or discontinue the tests at any time performance is considered unsatisfactory. Resumption of testing will cover untested elements and any replaced elements. The contractor shall furnish all test personnel, test instruments and equipment of the accuracy necessary to perform the test.

3. Final Tests: The Contractor shall notify the Engineer in writing of the proposed test date at least two (2) weeks in advance. Test date and time are subject to the approval of the Authority Having Jurisdiction. The Engineer will witness all final acceptance testing.
4. Upon the completion of a successful test, and prior to the final request for payment the Contractor shall:
   a. Provide all NFPA 72 acceptance test documents to the Owner and Engineer.
   b. Complete the NFPA 72 record of completion form.
   c. Provide as-built and O&M manuals.
   d. Provide a signed statement that the Owner had received the specified system operation and maintenance training and indicated spare parts.

3.10 TRAINING

A. Training shall be provided for the operations and maintenance staff. Training shall be conducted in the building where the system is installed or as designated by the Owner. The training period shall be a minimum of two four-hour sessions and shall start after the system is functionally completed but prior to final acceptance tests. The instructions shall cover all the items contained in the operating and maintenance instructions.

END OF SECTION 283100

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Hot-mix asphalt paving.
2. Cold milling of existing asphalt pavement.
3. Hot-mix asphalt patching.

B. Related Requirements:

1. Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition" for demolition and removal of existing asphalt pavement.
2. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
3. Section 321313 "Concrete Paving" for concrete pavement and for separate concrete curbs, gutters, and driveway aprons.
4. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.
5. Section 321400 "Unit Paving" for bituminous setting bed for pavers and for stone and precast concrete curbs.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
   a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
   b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.4 ACTION SUBMITTALS

A. Hot-Mix Asphalt Designs:

1. Certification, by authorities having jurisdiction, of approval of each hot-mix asphalt design proposed for the Work.
2. For each hot-mix asphalt design proposed for the Work.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates:

1. Aggregates.
2. Asphalt binder.
3. Asphalt cement.
4. Cutback prime coat.
5. Emulsified asphalt prime coat.
6. Tack coat.
7. Undersealing asphalt.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of Caltrans of for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.
2. Tack Coat: Minimum surface temperature of 60 deg F.
3. Asphalt Base Course and Binder Course: Minimum surface temperature of 40 deg F and rising at time of placement.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D692/D692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D1073 , sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D242/D242M , rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: ASTM D6373 binder designation PG 76-22M.

B. Asphalt Cement: ASTM D3381/D3381M for viscosity-graded material .

C. Cutback Prime Coat: ASTM D2027/D2027M, medium-curing cutback asphalt, MC-30 or MC-70 .

D. Emulsified Asphalt Prime Coat: ASTM D977 emulsified asphalt, or ASTM D2397/D2397M cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

E. Tack Coat: ASTM D977 emulsified asphalt, or ASTM D2397/D2397M cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

F. Water: Potable.

G. Undersealing Asphalt: ASTM D3141/D3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement materials is not allowed. from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

C. Sand: ASTM D1073 , Grade No. 2 or No. 3.

D. Paving Geotextile: AASHTO M 288 paving fabric; nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

E. Joint Sealant: ASTM D6690, Type II or III , hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. Samples shall be prepared and compacted using a Marshall compactor in accordance with ASTM D6926 or prepared and compacted using the gyratory compactor in accordance with ASTM D6925 .
3. Surface Course: The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. Samples shall be prepared and compacted using a Marshall compactor in accordance with ASTM D6926 or prepared and compacted using the gyratory compactor in accordance with ASTM D6925 .

B. Emulsified-Asphalt Slurry: ASTM D3910, Type 2 .

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

3.3 COLD MILLING

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

1. Mill to a depth as specified on the plans. .

2. Mill to a uniform finished surface free of excessive gouges, grooves, and ridges.
3. Control rate of milling to prevent tearing of existing asphalt course.
4. Repair or replace curbs, driveway aprons, manholes, and other construction damaged during cold milling.
5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
6. Patch surface depressions deeper than 1 inch after milling, before wearing course is laid.
7. Handle milled asphalt material in accordance with approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."
8. Keep milled pavement surface free of loose material and dust.
9. Do not allow milled materials to accumulate on-site.

3.4 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Undersealing: Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Placing Single-Course Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

E. Placing Two-Course Patch Material: Partially fill excavated pavements with hot-mix asphalt base course mix and, while still hot, compact. Cover asphalt base course with compacted layer of hot-mix asphalt surface course, finished flush with adjacent surfaces.

3.5 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch .

1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.6 SURFACE PREPARATION

A. Ensure that prepared subgrade has been proof-rolled and is ready to receive paving. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.

B. Herbicide Treatment: Apply herbicide in accordance with manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Cutback Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

D. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

E. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.7 INSTALLATION OF PAVING GEOTEXTILE

A. Apply tack coat uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gal./sq. yd..

B. Place paving geotextile promptly in accordance with manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.

C. Protect paving geotextile from traffic and other damage, and place hot-mix asphalt overlay the same day.

3.8 HOT-MIX ASPHALT PLACEMENT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course and binder course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
2. Complete a section of asphalt base course and binder course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.9 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
5. Compact asphalt at joints to a density within 2 percent of specified course density.

3.10 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density, Marshall Test Method: 96 percent of reference laboratory density in accordance with ASTM D6927 , but not less than 94 percent or greater than 100 percent.
2. Average Density, Rice Test Method: 92 percent of reference maximum theoretical density in accordance with ASTM D2041/D2041M, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.11 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:

1. Base Course and Binder Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course and Binder Course : 1/4 inch .

2. Surface Course: 1/8 inch .

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549/D3549M.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement in accordance with ASTM D979/D979M .

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared in accordance with ASTM D2041/D2041M, and compacted in accordance with job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples in accordance with ASTM D1188 or ASTM D2726/D2726M.
    a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than three cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method in accordance with ASTM D2950/D2950M and coordinated with ASTM D1188 or ASTM D2726/D2726M.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.13 WASTE HANDLING

A. General: Handle asphalt-paving waste in accordance with approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Painted markings applied to asphalt paving.
2. Painted markings applied to concrete surfaces.

B. Related Requirements:

1. Section 071800 "Traffic Coatings" for painting whole areas of building floors and pavements with coatings having an integral wearing surface.
2. Section 099113 "Exterior Painting" for painting exterior concrete surfaces other than pavement markings.
3. Section 099123 "Interior Painting" for painting interior concrete surfaces other than pavement markings.

1.3 ACTION SUBMITTALS

A. Product Data: Include technical data and tested physical and performance properties.

1. Pavement-marking paint, acrylic.

B. Shop Drawings:

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Samples: For each exposed product and for each color and texture specified; on rigid backing, 8 inches square.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. <Click here to find, evaluate, and insert list of manufacturers and products.>

B. Source Limitations: Obtain pavement-marking paints from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the ABA standards of the Federal agency having jurisdiction and ICC A117.1

2.3 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint, Acrylic: Acrylic, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952F, Type II, with drying time of less than three minutes.

1. Color: White, Red, Black, Blue.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement-marking substrate is dry and in suitable condition to begin pavement marking in accordance with manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow asphalt paving or concrete surfaces to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface. Mask an extended area beyond edges of each

stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 321723

SECTION 331415 - SITE WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water-distribution piping and related components outside the building for fire-suppression water service and terminated 5 ft. from building . Terminate water-service piping with appropriate fitting for extension by Division 21 .

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories."
2. Section 032000 "Concrete Reinforcing."
3. Section 211119 "Fire Department Connections."
4. Section 221216 "Facility Elevated, Potable-Water Storage Tanks."
5. Section 221219 "Facility Ground-Mounted, Potable-Water Storage Tanks."
6. Section 221223.11 "Facility Indoor Potable-Water Storage Tanks."
7. Section 315000 "Excavation Support and Protection."

1.2 DEFINITIONS

A. CDA: Copper Development Association.

B. EPDM: Ethylene-propylene-diene terpolymer rubber.

C. PA: Polyamide (nylon) plastic.

D. PE: Polyethylene plastic.

E. PP: Polypropylene plastic.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:

1. Ensure that piping, valves, meters, backflow prevention devices, and fire hydrants are dry and internally protected against rust and corrosion.
2. Protect threaded ends and flange faces against damage.

3. Set piping, valves, meters, backflow prevention devices, and fire hydrants in best position for handling and to prevent rattling.

B. During Storage: Use precautions for piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle products if size requires handling by crane or lift. Rig products to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

F. Protect flanges, fittings, and specialties from moisture and dirt.

G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.5 PROJECT CONDITIONS

A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service in accordance with requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of water-distribution service without Owner's written permission.

1.6 COORDINATION

A. Coordinate connection to water main with utility company.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.

B. Comply with standards of authorities having jurisdiction for domestic water-service piping, including materials, installation, testing, and disinfection.

C. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.

D. Piping materials to bear label, stamp, or other markings of specified testing agency.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

F. Comply with ASTM F645 for selection, design, and installation of thermoplastic water piping.

G. Comply with FM Approvals' "Approval Guide" and/or UL's "Fire Protection Equipment Directory" for fire-suppression water-service products.

H. Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-suppression water-service piping.

I. All piping and appurtenances intended to convey or dispense water for human consumption are to comply with the U.S. Safe Drinking Water Act (SDWA), with requirements of the Authority Having Jurisdiction (AHJ), and with NSF 61/NSF 372 or are certified in compliance with NSF 61/NSF 372 by an ANSI-accredited third-party certification body, that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.

2.2 PIPING MATERIALS

A. Comply with requirements in "Piping Applications" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and service sizes.

B. Potable-water piping and components comply with NSF 14, NSF 61, and NSF 372.

2.3 PVC PIPE AND FITTINGS

A. PVC Pipe: AWWA C900 , and Class 200, with bell end with gasket, and with spigot end.

1. Comply with UL 1285 for fire-suppression water service.
2. PVC Fabricated Fittings: AWWA C900, and Class 200, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
3. PVC Molded Fittings: AWWA C907, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.

2.4 PIPING JOINING MATERIALS

A. Gaskets for Ferrous Piping and Copper-Alloy Tubing: ASME B16.21, asbestos free.

B. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.5 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

2.6 GATE VALVES

A. Gate Valves - AWWA, Cast Iron:

1. Gate Valves - OS&Y, Rising Stem, Resilient Seated: Cast- or ductile-iron body and bonnet, with bronze or cast- or ductile-iron gate, resilient seats, and bronze stem.
   a. Standard: AWWA C509 or AWWA C515.
   b. Minimum Pressure Rating: 200 psig.
   c. End Connections: Mechanical joint, flanged, threaded, or push on.

2.7 GATE VALVE ACCESSORIES AND SPECIALTIES

A. Tapping-Sleeve Assemblies: Sleeve and valve compatible with drilling machine.

1. Standard: MSS SP-60.
2. Tapping Sleeve: Cast- or ductile-iron or stainless steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
3. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.

B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.

1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

C. Indicator Posts: UL 789, FM Global approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

2.8 RELIEF VALVES

PART 3 - EXECUTION

3.1 EARTHWORK

A. Comply with excavating, trenching, and backfilling requirements in Section 312000 "Earth Moving."

3.2 PIPING APPLICATIONS

A. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used unless otherwise indicated.

B. Do not use flanges or unions for underground piping.

C. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.

D. Underground fire-service-main piping NPS 4 to NPS 12 to be the following:

1. PVC, AWWA Class 200 pipe listed for fire-protection service; PVC Class 200 fabricated fittings; and gasketed joints.

3.3 VALVE APPLICATIONS

A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FM Global, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.

B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient - seated gate valves with valve box.

3.4 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Comply with Section 330500 "Common Work Results for Utilities" for piping-system common requirements.

B. Provide a continuous bare copper or aluminum tracer wire not less than 0.10 inch in diameter in sufficient length over each separate run of nonmetallic pipe.

3.5 INSTALLATION OF PIPING

A. Water-Main Connection:

1. Arrange with utility company for tap of size and in location indicated in water main.
2. Tap water main in accordance with requirements of water utility company and of size and in location indicated.

B. Make connections larger than NPS 2 with tapping machine according to the following:

1. Install tapping sleeve and tapping valve in accordance with MSS SP-60.
2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.

3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.

C. Make connections NPS 2 and smaller with drilling machine according to the following:

1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
4. Install corporation valves into service-saddle assemblies.
5. Install manifold for multiple taps in water main.
6. Install curb valve in water-service piping with head pointing up and with service box.

D. Comply with NFPA 24 for fire-service-main piping materials and installation.

E. Install PVC, AWWA pipe in accordance with ASTM F645 and AWWA M23.

F. Bury piping with depth of cover over top at least 30 inches in depth , and according to the following:

1. Under Driveways: With at least 36 inches of cover over top.

G. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

H. Extend fire-suppression water-service piping and connect to water-supply source and building systems at outside face of building wall in locations and pipe sizes indicated.

1. Terminate fire-suppression water-service piping at building wall until building and fire-suppression piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building fire-suppression piping systems when those systems are installed.

I. Sleeves are specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"

J. Mechanical sleeve seals are specified in Section 220517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"

K. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"

L. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

M. Comply with Section 211200 "Fire-Suppression Standpipes," Section 211313 "Wet-Pipe Sprinkler Systems," and Section 211316 "Dry-Pipe Sprinkler Systems" for fire-suppression-water piping inside the building.

N. Comply with Section 221116 "Domestic Water Piping" for potable-water piping inside the building.

3.6 JOINT CONSTRUCTION

A. Comply with Section 330500 "Common Work Results for Utilities" for basic piping joint construction.

B. Make pipe joints according to the following:

1. PVC Piping Gasketed Joints: Use joining materials in accordance with AWWA C900. Construct joints with elastomeric seals and lubricant in accordance with ASTM D2774 or ASTM D3139 and pipe manufacturer's written instructions.

3.7 INSTALLATION OF ANCHORAGE

A. Anchorage: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Concrete thrust blocks.
2. Locking mechanical joints.
3. Set-screw mechanical retainer glands.
4. Bolted flanged joints.
5. Heat-fused joints.
6. Pipe clamps and tie rods.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: In accordance with AWWA C600.
2. Gasketed-Joint, PVC Water-Service Piping: In accordance with AWWA M23.
3. Bonded-Joint Fiberglass, Water-Service Piping: In accordance with AWWA M45.
4. Fire-Service-Main Piping: In accordance with NFPA 24.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.8 INSTALLATION OF VALVES

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.

C. UL-Listed or FM Global-Approved Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.

D. UL-Listed or FM Global-Approved Valves Other Than Gate Valves: Comply with NFPA 24.

E. MSS Valves: Install as component of connected piping system.

F. Comply with requirements for concrete piers in Section 033000 "Cast-in-Place Concrete" for support of valves and piping not direct buried.

3.9 CONNECTIONS

A. See Section 330500 "Common Work Results for Utilities" for piping connections to valves and equipment.

B. Connect water-distribution piping to existing water main . Use tapping sleeve and tapping valve (hot tap method). .

C. Connect water-distribution piping to interior fire-suppression piping.

D. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

E. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.10 FIELD QUALITY CONTROL

A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.

1. Increase pressure in 50 psig increments and inspect each joint between increments. Hold at test pressure for one hour; decrease to 0 psig. Slowly increase again to test pressure and hold for one more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

C. Prepare reports of testing activities.

3.11 IDENTIFICATION

A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Section 312000 "Earth Moving."

B. Permanently attach equipment nameplate or marker indicating plastic water-service piping, on main electrical meter panel. See Section 330500 "Common Work Results for Utilities" for identifying devices.

3.12 CLEANING

A. Clean and disinfect water-distribution piping as follows:

1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
    a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
    b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for three hours.
    c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
    d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

END OF SECTION 331415

Field Name	Bookmark	Description / Comment
Owner	Owner	Airport Owner / Client / City
GC	Main Contractor	General Contractor
Contractor	BHS Contractor	BHS Contractor
SP	O&M Service Provider	O&M Service Provider
Proposer	Proposer	A BHS Contractor tendering for the Contract during RFP
PM	Contract Administrator	Project Administrator / Project Manager
HBS	HBS/CBS	Hold Baggage Screening or Checked Baggage Screening
CBRA	CBRA	CBRA or ETD
BHS	CBIS/BHS	Baggage System / Checked Baggage

Font Color	Specification Text/Content	Status
Dark Red	Imperial dimensions	Done
Red	TSA specific PGDS requirement	
Orange	Covered by DIA/DEN Orange Book	
Yellow	Not used	
Light Green	Not used	
Green	Metric dimensions	Done
Light Blue	Tilt Tray Sorter (TTS)	Done
Blue	EBS	Done
Dark Blue	Supporting content (Full specification)	
Purple	ICS aka DCV/HSS	Done

SAN LUIS OBISPO COUNTY REGIONAL AIRPORT

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

Section 34 77 16
Baggage Handling System (BHS)

Baggage Screening Mods.

Technical Specifications

Division 34

Mead&Hunt

June 16, 2026

logplan

Revisions

Revision	Date	Remark/Explanation of Changes

Note to the Reader:
This Specification has been prepared such that cross-references within the Specification are active hyperlinks within the document allowing the reader to easily navigate the content. This functionality works from the Table of Content, list of figures as well as specific cross-references within the text of the specification.
Additionally, the Specification contains a detailed list of bookmarks within the PDF navigation pane matching the full Table of Content, again to aid the reader in navigating the Specification.

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PART 1 - GENERAL REQUIREMENTS

A. This specification is intended for all new work at San Luis Obispo County Regional Airport (SBP). This specification and the Contract Drawings are meant to define the work requirements necessary for the BHS Contractor to provide a safe, and efficient system for the Owner and all personnel who operate, maintain or have direct access to the completed BHS.

1.2 Conflicts

A. The BHS Contractor is advised to provide written notification of any conflicts that might arise in the proposed design at the time of their offer where the BHS Contractor believes the design cannot be accomplished or fails to meet any of the performance criteria identified in this Specification.

B. Failure of the BHS Contractor to identify issues at the time of their offer places responsibility on the BHS Contractor for establishing and achieving all the performance criteria identified in this Specification.

C. The BHS Contractor will be held to all the requirements of the Contract Documents. In the event of a discrepancy between the Specifications and issued Drawings the more stringent of the requirements will prevail.

D. The Drawings and Specifications take precedence when they are more stringent than codes, statutes, or ordinances in effect. Applicable codes, ordinances, standards, and statutes take precedence when they are more stringent than the Drawings and Specifications.

E. The BHS Contractor shall notify the Owner of any conflicts identified between the Contract Documents and federal or international law within three (3) days of discovery. The Owner will have the sole right to decide which requirement will govern.

F. Under no circumstances shall deviations identified by the BHS Contractor relieve the BHS Contractor from the requirements defined within these Specifications unless approved in writing by the Owner.

1.3 Reference Documents

A. General
1. Drawings, General and Special Conditions, Division 1 - General Requirements and other applicable Technical Specifications apply to work of this Section 34 7739.
2. It is the BHS Contractor's responsibility to contact the applicable Supplier, Firm, and/or Engineer to request documents needed for coordination, equipment interfacing, referencing, and testing requirements.

B. Specific Related Technical Sections
1. Division 1, Section 01010 "Summary of Work"
2. Division 1, Section 01014 "Work Sequence and Constraints"
3. Division 1, Section 01300 "Submittals"
4. Division 1, Section 01310 "Schedule"
5. Division 26, "Electrical"

C. External Reference Documents
1. 'Screening Equipment Installation Guide' specific to the screening equipment supplier (to be confirmed by TSA).
2. Screening equipment to BHS Interface Design Document.
3. IATA Passenger services Conference Resolution's manual.
4. PGDS – Planning Guidelines and Design Standards for Checked Baggage Inspection Systems, Version 8.0.
5. ATA Facility Planning Guidelines – New Baggage Handling Systems for Passenger Terminals (latest version).

1.4 Definition of Terms

A. Contract Documents
1. The Contract Documents include (but are not limited to) the baggage handling system drawings, architectural drawings, communications/network drawings, fire protection system drawings, mechanical, electrical, and plumbing (MEP) drawings, structural drawings, program phasing plans, contract provisions, special provisions, Specifications, addendum, RFIs, general project correspondence and formally issues Change Orders from the Owner, if any. The Contract Documents define the Scope of Works of this project. The BHS Contractor is to familiarize himself with all of the Contract Documents and how they interface with the installation of the baggage system.

B. Main Contractor
1. The Main Contractor shall mean the individual or group of companies, which have contracted with the Owner for the construction of the complete airport construction project. The Main Contractor sub-contracts out the Scope of Works defined in these Specifications to the BHS Contractor.

C. BHS Contractor
1. The BHS Contractor shall mean the BHS Contractor responsible for the Scope of Works defined herein. The BHS Contractor shall design, execute, and complete the Works in accordance with the Contract, and remedy any defects in the Works. When completed, the

Works shall be fit for the purposes for which the Works are intended as defined in the Contract.

D. BHS Integrator
1. The BHS Integrator shall mean all the responsibilities of the BHS Contractor in addition to providing BHS equipment and/or BHS controls and/or BHS installment for the project.

E. Supplier and Sub-Contractor
1. Supplier and Sub-Contractor shall mean any external company or 3rd party hired by the BHS Contractor for the supply, delivery, installation, testing or other relevant activities. Such companies shall refer to the BHS Contractor and are subject to the same terms and conditions of this contract as the BHS Contractor.

F. Owner
1. The Owner shall mean the airport authority.

G. Project Management Consultant (PMC)
1. The Project Management Consultant shall mean the company or consortium of companies working on behalf of the Owner and Stakeholders to ensure that the execution of the project is done according to the Owner's defined processes.

B. Engineer
1. The Engineer means the person or company appointed by the Owner to act as the Engineer for the purposes of the Contract or other person appointed from time to time by the Owner and notified to the BHS Contractor. Logplan LLC is the Engineer.
2. The Engineer shall retain the role of the Concept Designer of the Contract and shall have the sole discretion with regards to approval of all design issues and any interpretations thereof.
3. The BHS Contractor shall comply with any instructions given by the Engineer or delegated assistant in writing, on any matter related to the Contract.

C. Furnish
1. Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

D. Install
1. Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, as applicable in each instance.

E. Provide
1. Except as otherwise defined in greater detail, the term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

F. Sub-system
1. A group of independent but interrelated elements comprising a unified whole which can be tested as a group and which forms a major sub-division of the complete system.

G. Line of Sight
- Line of sight is defined as the unobstructed view or access path from any location within the CBIS/BHS to any component or safety device and shall not exceed a maximum 60’.

H. Failure or Breakdown
- A failure is the event when a piece of hardware or software fails and stops working as intended.
- A failure is the malfunctioning of a system component (physical or software), which interrupts normal operational procedures, i.e., a fault/malfunction occurs requiring an Operator to go to the location of the fault to check or remedy the problem. Such cases need not necessarily result in an impairment of material flow (e.g., defective outbound monitor).

I. Fault or Outage
- A fault or outage is a situation when operation stops, i.e., the processing of bags is halted.

J. Down-Time
- Defined as the time taken to repair defective equipment and return to service once suitably qualified repair personnel have responded.
- All time to inspect, disassemble, reassemble, calibrate, and bring back into service shall be regarded as down time.
- An allowance of ten (10) minutes to obtain replacement parts shall be included in any downtime calculations requiring replacement of hardware.
- An allowance of one (1) minute to respond to the defective equipment shall be included in any downtime calculations.

K. Up-Time
- Equipment is in service and available for use. This includes when the equipment is in energy saving mode.

L. User Configurable
- An interface parameter that can be configured on a workstation that is normally accessible to the User (e.g., O&M, TSA, etc.).

M. User
- User is the general term used for the personnel working with and using the CBIS/BHS, e.g., O&M personnel, airlines, control room operators, Customs officers, and TSA officers.

N. Black-out Days / Embargo Days
- Defined periods that the BHS Contractor shall not perform certain types of work. Emergency work necessary to keep an operational system operating shall be properly coordinated with the Owner.

O. Plug and Play
- A technique which facilitates the discovery of a hardware component in the system, without the need for physical device configuration, or user intervention in resolving resource conflicts.

P. Off-site Access

- A mechanism that provides electronic access to the CBIS/BHS from a location that is outside the Airport boundary, e.g., a support technicians place of residence.

Q. Low Level Controls (LLC)
- Low Level Control shall mean all hardware and software required to perform the low-level field equipment control in a safe and controlled manner as defined herein.
- LLC includes PLC's, bus communications, local visualization at panels, sensors, lights, beacons, equipment status, signal, alarms, E-stop, and failsafe equipment functions as minimum.

H. Warm Standby / Warm Back-up (OUTBOUND)
- A Warm Standby is used as a manual failover mechanism to provide increased availability in system configurations.
- A Warm Standby configuration contains a pair of duplicate and identical hardware components installed, e.g., PLC, server, computers or similar. Only the active part contains the application software and is running and connected to the working system.
- When a component fails in the Warm Standby configuration the equipment-controlled stops, e.g. conveyors controlled by a PLC will stop. In order to continue operation an operator has to manually switch the second part of the Warm Standby configuration into operation.
- As no data synchronization takes place between the two (2) parts of the Warm Standby configuration the system has to be flushed for baggage and brought to an empty start-up condition before operation can resume. All data tracking will be lost during a Warm Standby switch-over.
- Following a switch-over from an active part to an inactive part of the Warm Standby configuration, the newly active part shall request information from the HLC to ensure data integrity of tracking information based on the CBIS/BHS condition prior to switch-over (and/or failure of the previously active part) before commencing operation after a switch-over.
- It shall be possible to reset and replace a failed processor without affecting the operation. A failure of either processor shall be alarmed and reported.
- Provide health messages (heartbeat) between the active and inactive parts of the Warm Standby configuration to report the operational status of all parts to the SCADA.

R. Cold Standby / Cold Back-Up (INBOUND)
- A Cold Standby is used as a manual failover mechanism to provide increased availability in system configurations.
- A Cold Standby is the physical replacement of a PLC inside the MCP during a PLC failure.
- PLC failure message to be shown on the HMI or SCADA.
- Spare PLC to be stored with spare parts.
- Spare PLC to be inserted manually once failed PLC is removed.

S. SCADA
- For the purposes of this Specification SCADA and Graphics shall be synonymous for an interface that allows the User to identify the actual status of the CBIS/BHS and monitor and configure system operations through dialogues and reports.

T. Redundancy

- Redundancy shall mean the duplication of critical components of the system and/or the alternative baggage transportation routes with the intention of increasing reliability of the CBIS/BHS.

U. Load Point
- A load point shall mean any input point where bags are inducted or introduced to the CBIS/BHS. Such points include, but are not limited to, ticketing, arrival inputs, and CBRA reinsert points.

V. Unload Point
- An unload point shall mean any point in the system where bags are removed. Such points include, but are not limited to, Make-up laterals, Claim carousels, OS Claim run-out belts, and CBRA.

W. Guardrails
- Guardrails shall be synonymous with 'Impact Protection'.

X. Remove
- Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

Y. Remove and Salvage
- Detach items from existing construction, wrap and label and deliver them to the Owner ready for reuse.

Z. Remove and Reinstall
- Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

AA. Existing to Remain
- Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed, and salvaged, or removed and reinstalled.

BB. Installation
- Installation shall mean the phase in the Construction Schedule in which the BHS Contractor installs equipment on-site. Installation shall also mean the activity by the BHS Contractor to put in place equipment on-site.

CC. Acceptance Testing
- Acceptance Testing shall mean the phase in the Construction Schedule where the Owner verifies that the components, sub-systems, and system is compliant with the Contract requirements. It is the responsibility of the BHS Contractor to plan, execute and document all tests as directed by the Owner during Acceptance Testing. The BHS Contractor shall as minimum, but not limited to, perform the tests defined herein. The BHS Contractor shall conduct other Owner defined tests as deemed necessary by the Owner.
- Acceptance Testing shall also mean the activities carried out during the Acceptance Testing phase.

DD. Practical Completion

- Practical Completion shall mean a milestone achieved by the BHS Contractor and accepted by the Owner where the Works is practically complete and is available for beneficial use with only minor outstanding defects, if any.
- The BHS Contractor shall prior to Practical Completion ensure that all defects identified through System Acceptance Testing and recorded in the Punch List have been rectified. Only minor defects can be outstanding at the time of Practical Completion.

EE. Beneficial Use / Beneficial Occupancy

- Beneficial Use shall mean the milestone when the Owner commences beneficial use of the Works. Upon commencement of Beneficial Use the Start-up System & Monitoring Period shall commence.
- The Owner shall take-over responsibility for the operation and maintenance of the portions of the CBIS/BHS, which has gone into beneficial use.

FF. Substantial Completion

- Substantial Completion shall mean a milestone achieved by the BHS Contractor and accepted by the Owner where the Works is substantially complete and the CBIS/BHS has successfully completed the Start-up System & Monitoring Period.
- General Warranty cannot commence prior to Owner issuance of a Substantial Completion Certificate.

GG. Final Completion and Acceptance

- Final Completion and Acceptance shall mean the acceptance of the Works by the Owner in accordance with Owner regulations.
- The Design Warranty cannot commence prior to Owner issuance of Final Completion and Acceptance of the Works.

1.2 Acronyms

Table 1: Abbreviations & Acronyms

ID	Acronym	Full Description
1.	AC	Alternating Current
2.	AFF	Above Finished Floor
3.	ANSI	American National Standards Institute, Inc.
4.	ASME	American Society of Mechanical Engineers
5.	ATA	Air Transport Association
6.	ATP	Acceptance Test Plan
7.	ATR	Automatic Tag Reader
8.	AWS	American Welding Society
9.	BHS	Baggage Handling System
10.	BIDS	Baggage Information Display System
11.	BMA	Baggage Measuring Array
12.	BOM	Bill of Materials
13.	B/H (bph)	Bags per Hour
14.	B/M (bpm)	Bags per Minute
15.	BPM	Baggage Processing Message
16.	BRS	Baggage Reconciliation System
17.	BSM	Baggage Source Message
18.	CAR	Corrective Action Report
19.	Carrier	Synonymous with Airline
20.	CBIS	Checked Baggage Inspection System

ID	Acronym	Full Description
21.	CBRA	Checked Baggage Resolutions Area
22.	CCR	BHS Contractor Change Request
23.	CO	Change Order
24.	CR	Change Request
25.	DC	Direct Current
26.	DCS	Departure Control System
27.	DDS	Detailed Design Specification
28.	EDS	Automated Explosive Detection System
29.	ETD	Explosive Trace Detection
30.	FAA	Federal Aviation Administration
31.	FAT	Factory Acceptance Testing
32.	FDS	Functional Design Specification
33.	FFL	Finished Floor Level
34.	FPM	Feet per Minute
35.	Graphics	Synonymous with SCADA or GUI
36.	GUI	Graphical User Interface
37.	HVAC	Heating, Ventilation & Air Conditioning
38.	I/O	Input/Output
39.	IATA	International Air Transport Association
40.	ICAO	International Civil Aviation Organization
41.	IQT	Image Quality Test
42.	iSAT	Integrated Site Acceptance Testing of EDS screening equipment
43.	ISO	International Organization for Standardization
44.	ITA	Independent Testing Agency
45.	License Plate	A 10-digit number assigned by the airline Host as defined by IATA RP 1740
46.	LG	Longitudinal Grove (conveyor belting top surface)
47.	LLC	Low Level Control
48.	MICS	Manual Intervention Control Station
49.	MCP	Motor Control Panel
50.	MSDS	Material Safety Data Sheets
51.	NCR	Nonconformance Report
52.	NEC	National Electric Code
53.	NEMA	National Electrical Manufacturers Association
54.	NFPA	National Fire Protection Association
55.	NTP	Notice to Proceed. Documentation authorizing the BHS Contractor to commence Works after award of Contract
56.	O&M	Operation & Maintenance
57.	OOG	Out-of-Gauge. Bags which by TSA definition can be processed through a normal size baggage system but cannot be processed by an EDS screening machine. Such bags by-pass the EDS machines and are routed directly to the CBRA for TSO inspection.
58.	OSHA	Occupational Safety and Health Administration
59.	OSR	On-Screen Resolution. A TSA protocol for visual inspection of ALARMED images generated by EDS screening equipment
60.	OS	Oversized. Bags which by TSA definition cannot be transported through a normal size baggage system and which are transported through dedicated oversize conveyors and associated screening.
61.	P/N	Part Number
62.	PC	Personal Computer
63.	PEC	Photo Electric Cell (photocell)
64.	PGDS	Planning Guidelines and Design Standards for Checked Baggage Inspections Systems
65.	PLC	Programmable Logic Controller
66.	QA	Quality Assurance
67.	QC	Quality Control

ID	Acronym	Full Description
68.	RA	Right Angle. A shaft mounted RA motor/reducer is a motor gearbox combination with a hollow shaft that mounts directly onto the roller shaft, where the motor is typically mounted in a vertical orientation.
69.	RAM	Random Access Memory
70.	RF	Radio Frequency
71.	RFI	Request for Information
72.	ROW	Right of way.
73.	RT	Rough Top (conveyor belting top surface).
74.	SAT	Site Acceptance Testing
75.	SBE	Small Business Edition (Norton End-Point Antivirus Protection)
76.	SCADA	Supervisory Control and Data Acquisition
77.	Slack	Unallocated time in the construction schedule, commonly referred to as 'float'
78.	SMS	Short Message Service
79.	SS	Stainless steel
80.	SSI	Sensitive Security Information
81.	SSPC	The Society for Protective Coatings
82.	TOB	Top of Belt
83.	TRR	Test Readiness Review
84.	TSA	Transportation Security Administration
85.	UI	User Interface
86.	UL	Underwriters Laboratories Inc.
87.	UPS	Uninterruptible Power Supply
88.	VAC	Volts Alternating Current
89.	VDC	Volts Direct Current
90.	VFD	Variable Frequency Drive

1.3 Introduction

A. Objectives
- The objectives of the baggage screening system's functionality and design are:
  a. Design, manufacture, and install in accordance with the Contract Documents.
  b. Ensure safeguarding for a future installation of a stand-alone CT-80DR+ EDS machine and associated processes compliant with Planning Guidelines and Design Standards for Checked Baggage Inspection Systems v 8.0 provided by the TSA (including updates and/or revisions).

B. Language
- The official language of this project is US English. All documentation and correspondence in connection with this project shall be done in the official language.

1.5 Conventions

C. Organization of Drawings and Specifications
- Organization of the Specifications into divisions and sections, and arrangement or numbering of drawings is intended solely for the convenience of the BHS Contractor in his responsibilities to divide the Works among sub-contractors or to establish the extent of Works to be performed by any trade.

- The Owner does not assume any liability arising out of jurisdictional issues or claims advanced by trade organizations or other interested parties based on the arrangement or organization of Drawings or Specifications.

D. Gender and Number
- For convenience and uniformity, parties to the Contract, including the Owner, BHS Contractor, and their sub-contractors, suppliers, installers, consultants, or other interested parties are referred to throughout the Contract Documents as if masculine in gender and singular in number. Such reference is not intended to limit the meaning of the Contract Documents to the masculine gender or singular number.

E. Singular vs. Plural
- Materials, products, equipment, or other items of Works referred to in the singular shall be construed as plural where applicable by the intent of the Contract Documents and shall not limit quantities to be provided by the BHS Contractor.

1.4 Codes & Standards

A. General
- All Works shall comply with applicable federal, state, and local codes, laws, acts, ordinances, and all authorities having jurisdiction.
- All equipment furnished shall carry a listing from an independent testing lab such as UL.

B. Screening Machine Supplier Reference Documents
- Screening equipment installation guide specific to the screening equipment supplier (to be confirmed by TSA),
- Screening equipment to BHS Interface Design Document.

C. Transportation Safety Administration (TSA) Documentation
- PGDS - Planning Guidelines and Design Standards for Checked Baggage Inspection Systems, Version 8.0.
- Transportation Safety Administration (TSA) Interface Requirements Document (IRD).

D. Federal Safety & Health Standard
- William Steiger Occupational Safety and Health Act of 1970, Public Laws 91-596
- Bureau of Radiology Health Safety Specifications for Class II-B laser devices

E. Occupational Safety and Health Standards (OSHA)
- Part 1910 – Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
- Part 1917 – Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
- Part 1926 – Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.

F. Local Codes
- City and County Building Code plus Amendments.
- City and County Fire Protection Code plus Amendments.

G. Conveyor Equipment Manufacturers Associates (CEMA)
- CEMA standard No. 402-1992 Belt Conveyors
- CEMA standard No. B105.1-1990 Steel Conveyor Pulleys

H. National Electrical Code (NEC)
- NEC electrical standards

I. IATA Standards
- IATA Passenger Services Conference Resolutions Manual.
- IATA Airport Development Reference Manual (9th Edition - January 2004)

J. IATA Recommended Practices
- Res 706
- RP 1706
- RP 1740 a
- RP 1740 b
- RP 1740 c
- RP 1740 d
- RP 1745
- RP 1797

K. ICAO Standards
- International Civil Aviation Organization (ICAO)
- ICAO annex 17, Safeguarding International Civil Aviation Against Acts of Unlawful Interference
- ICAO 8973, Security Manual for Safeguarding Civil Aviation Acts of Unlawful Interference (Sixth Edition - 2002)

1.5 Scope of Works

A. General
- The Scope of Works for this Contract covers the design, supply, installation, test, commissioning and start-up of a complete operating and maintainable Baggage Handling System (BHS) as part of the Baggage Screening Mods at San Luis Obispo County Regional Airport.
- The BHS Contractor is fully responsible for the system design, equipment selection, fabrication and installation, the functionality, the performance, the efficiency, the maintainability, and all interfaces of the system to satisfy the requirements defined in the Contract Documents.
- The BHS Contractor shall use only pre-approved OEM equipment.
- The system shall be engineered to sustain the heavy-duty impact and abuse experienced in airport baggage handling operations, while considering design elements of safety, functionality, simplicity, reliability, and maintainability.
- The BHS Contractor shall ensure that when completed the CBIS/BHS meets all local, state, and federal laws, codes and safety standards and assures a safe and efficient system for all personnel who operate it, maintain it, or have access to it.
- The BHS Contractor shall provide all professional skill, labor and tools, supplies, equipment, supervision, materials, and everything necessary to perform equipment

removal, demolition, refurbishment, supply, installation, testing, commissioning, training, startup services, and complete all of the Works described, drawn, set forth, shown, and included in the Contract Documents.

- The CBIS/BHS system layout drawings are contained in the "QB" series of the Contract Drawings and the BHS Contractor shall ensure that the design fits within the envelope (right-of-way) defined by the Contract Drawings to make the best use of mechanical and electrical rights of way for the overall good of the Airport.
- Any modifications to the Contract Drawings required to accommodate the BHS Contractor's final design and layout will be done at the BHS Contractor's expense. All modifications must bear the stamp of a Professional Engineer, licensed in the State of California and meet the requirements of the California Building Department, and shall be approved by the Owner in writing.
- The general construction Works defined in the Contract Documents will be performed by the Main Contractor.
- The BHS Contractor will most likely be a Sub-Contractor to a larger Main Contractor, who will be responsible for building and modifying the terminal facility.
- The BHS Contractor shall be responsible for other facilities and services necessary to properly execute and complete the BHS Contractor's Scope of Works, including security for worksite, and the storage and protection of all materials awaiting incorporation into the Works.
- The BHS Contractor is responsible for the general construction Works required in the Contract Documents. The BHS Contractor is responsible for all works performed by Others including the necessary coordination, management and supervision of their activities in accordance with the Contract Documents.

B. Coordination Responsibilities

- The Contract Drawings depict certain mechanical dimensional constraints necessary for coordination with the building structure and for design preference. They also indicate the general arrangement of equipment, circuits, outlets, panel boards and other mechanical and electrical Works in a schematic form; however, re-circuiting will not be permitted without specific acceptance. Data presented on the drawings is as accurate as planning can determine, but accuracy is not guaranteed and field verification by the BHS Contractor of all dimensions, locations, levels, etc., to suit field conditions is required. All design responsibilities are with the BHS Contractor.
- It is the BHS Contractor's responsibility to request and obtain all necessary information, drawings and Specifications applicable to the Works from the Owner. These Specifications are a part of the Contract Documents, which define the functional requirements, and establish the minimum standard of quality for the project.
- Any design, engineering, or other professional service provided by the BHS Contractor shall be performed in accordance with all terms of the Contract Documents. The BHS Contractor shall employ such competent architects, engineers and consultants, appropriately licensed and/or registered in the State of California, as shall be necessary for the prompt, efficient and proper performance of the obligations under this project.
- The BHS Contractor shall coordinate his Scope of Works with the Main Contractor to ensure the project is delivered on-time and budget and to the right quality as defined by the Contract Documents.

C. New Equipment

- The BHS Contractor shall furnish, install and maintain all necessary equipment to provide a complete, operable, maintainable and safe system on a "Turn-Key" basis, including, but not limited to, floor supports, anchors, guard rails, impact protection/bollards, conveyor bed sections, framing, drives, take-ups, sideguards, shrouding, stainless steel panels and equipment trim, safety protection, security doors, fire doors, draught curtains, carousels, electrical power distribution, power panels, controls and control panels, MCP's, PLC's and I/O, motors, motor starters, disconnects, conduit and wiring, field bus, control stations/operator panels, operator devices (push buttons and switches), PEC, encoders, proximity switches, limit switches, sensors, beacons, horns, E-stop, test baggage, spare part hoist/lift and any other materials or equipment whether specifically shown and described, or implied in the plans and Specifications or wherever required to effectively accomplish the intended functions of the CBIS/BHS.
- The BHS Contractor is responsible to design and furnish a complete, integrated control system in compliance with the Contract Documents. This includes the testing, commissioning, and training of the installed system according to these Specifications and to the satisfaction of the Owner. Once approved by the Owner, the BHS Contractor shall turn over to the Owner a fully operable and maintainable Baggage Handling System, along with the complete as-built documentation, including Maintenance and Operating Manuals.

D. Modifications to Existing Equipment

- The BHS Contractor shall ensure a complete functional baggage system and shall modify any existing BHS equipment (whether shown on the drawings or not) that is in the way of the implementation of Baggage Asset Replacement including, but not limited to, support structures, conveyors, platforms, screening equipment support, roller doors, etc. Coordinate and execute the work required to existing services that are obstructing the installation of this project scope. Such modifications shall encompass removal of existing baggage equipment and rerouting/modification of all work necessary to allow routing of the new equipment and to return the existing system to an operational state.
- As per the Drawings the BHS Contractor shall complete the work required to modify the existing CBIS/BHS including any and all power, data, furnishings, hardware, equipment, and functionality required to complete the work.
- Any modifications to existing operational services/equipment shall not interrupt existing operations. The BHS Contractor shall in writing obtain approval from the Owner to take out of service any existing operational services/equipment and minimize to the greatest extent possible the time, which such service/equipment is out of service including working multiple shifts in order to bring said equipment back on line as quickly as possible.
- The BHS Contractor shall pay and perform all required LLC and HLC hardware upgrades as a result of the modifications required to complete the Scope of Works.
- Modify (or replace) the existing SCADA to reflect modifications to the existing baggage handling equipment and to meet the requirements as described in these Specifications. The SCADA shall encompass all new and existing equipment.
- Modify as necessary existing equipment that connects / interfaces with equipment provided under this Contract to ensure that the requirements of these Specifications are met.
- When modifying existing system, notify and obtain approval from the Owner, if existing functionality cannot be maintained or if in the BHS Contractor's opinion, it would be beneficial for the Owner to change the functionality.
- When a system is modified, the BHS Contractor shall also modify any upstream and downstream functionality affected by the modification.

- Ensure proper disassembly, transportation, refurbishing and storage of modified equipment in a manner that enables reassembly of the equipment in its final location in a like-new condition.

E. Demolition of Existing Equipment
- The Scope of Works include the removal of existing BHS Systems as per Contract Drawing Demo series.
- The BHS Contractor shall disassemble and remove obsolete equipment by removing nuts, bolts, screws, or other fasteners with the use of hand tools. Sections/pieces that are too large to be removed through existing doorways and openings may be cut into smaller sections following the Owner's safety procedures.
- Removed equipment shall be disposed of following the Owner's recycling procedures.
- Information regarding existing equipment designated for demolition shall be obtained from the Owner (e.g., electrical as-built drawing, O&M manuals, PLC architecture).

1.6 Existing Conditions

- The BHS Contractor shall have had the opportunity to visit the jobsite to verify dimensions, measurements, locations, elevations, interfaces and obstructions relevant to the Works prior to submitting his proposal. Any conflict identified during the project execution shall be the responsibility of the BHS Contractor and included in the Contract price.
- The BHS Contractor shall perform a complete mechanical and electrical field survey of the existing CBIS/BHS equipment and maintain consistency with the existing conveyor components in term of motors, gearboxes, bearing, belting, field control components and MCP control components to reduce parts inventory.
- The Scope of Works shall include the cost of relocating existing equipment, piping, ductwork, and conduit to allow for installation of the new Works.
- All installation work related to operational equipment needs to be scheduled in a way to ensure that there is no interruption of the live operations.
- Connections to existing systems shall be made so that the use of these systems is not interrupted without the Owner's approval as to the time and duration.
- Information regarding existing equipment designated for modification or to remain shall be obtained from the Owner (e.g., electrical as-built drawing, O&M manuals, PLC architecture).

B. Outbound/Screening System
- The existing outbound/screening systems shall be fully replaced with the Scope of Works under this Contract and depicted in the Contract Drawings.

C. Bag Make-up Area
- The existing Bag Make-up Area/Runout Pier shall be fully replaced with the scope of works under this Contract and depicted in the Contract Drawings.

D. Graphics/SCADA
- The existing graphical or SCADA monitoring system shall be fully replaced or modified with the scope of works under this Contract and depicted in the Contract Drawings.

1.7 Submittals

A. General

- The BHS Contractor shall read this document and, where indicated in the individual sections, provide all relevant submittals. The BHS Contractor shall provide a submittal schedule within Thirty (30) days after Notice to Proceed.
- The BHS Contractor shall ensure that submittals are produced and supplied in a timely manner so as to ensure scheduled dates are maintained. Allow a minimum cycle of ten (10) business days for review of each submittal by the Owner.
- All submittals shall become the property of the Owner.
- The BHS Contractor shall maintain a file of all approved submittal documents at the worksite/ digitally accessible. The complete file of approved submittal documents shall be turned over to the Owner with the As-Built Documents at the end of the project.
- The BHS Contractor shall at the time of submission describe variations from the Contract Documents in writing, separate from the submittal document. If the Owner approves any such variations, an appropriate Contract Change Order shall be issued except that, if the variation is minor and does not involve a change in price or in time of performance, a modification need not be issued. If a submission contains variations and the variation column is not marked on the transmittal form, it will not be considered for review and acceptance. Should the proposed variation from the specified product be substantial, a description must be included which outlines all the differences, including maintenance and utility services along with any cost savings from an item not containing the variation, utilizing the Substitution Request Form as provided by the Owner.

B. Owner Document Formatting Requirements

a. The documents, reports, manuals, journals and the like submitted to the Owner for information, review, approval, or construction as part of this project shall contain the information defined below.

b. Each document submitted shall be of a high quality and have been proofread by the BHS Contractor's manager responsible for that particular submission.

- Cover Page
  a. Each document shall contain a front cover page detailing the contents of the document, project name, BHS Contractor's name and logo, date of submission, revision number, and other relevant information as defined by the Owner.
- Revision History
  a. Each document shall contain a revision history table at the beginning of the document after the front cover page.
  b. The revision number shall be updated every time the document has been changed since the last submission.
  c. A summary of the changes made in the document shall be described in the revision history table. The detail changes made since the last submission shall clearly be identified using "track" changes in the document or a similar manner of mark-up.
- Table of Contents
  a. Each document shall contain a table of contents at the beginning of the document after the revision history page.
- Header
  a. Each document shall contain a document header, which is included on every page. The header shall contain the project name, document title, and contract number as minimum.

- Footer
  a. Each document shall contain a document footer, which is included on every page. The footer shall contain the document revision, date of preparation, page number and total number of pages as minimum.
- Paragraph Numbering
  a. To assist with the document review process each chapter, section and paragraph of the document shall be clearly and uniquely numbered.
- Language
  a. Each document shall be prepared in the language(s) applicable for this project.
  b. Any translation required shall be done by the BHS Contractor and submissions are not complete before translated documents are included with the original document.

C. Drawing Formatting Requirements
  a. The engineering drawings submitted to the Owner for information, review, approval, or construction as part of this project shall contain the information defined below.
  b. Any reproduction of Contract Drawings for submittal as BHS Contractor's drawings is prohibited. Drawings produced in such a manner will be rejected.
  c. Drawings shall follow local guidelines and industry standards.
  d. The BHS Contractor shall use a drawing naming convention acceptable to the Owner. The convention shall allow identification of building, floor level, building sector, and layout/section/detail from the drawing number assigned.

- Title Block
  a. Each drawing shall include a title block and drawing frame to clearly show the extensions of the drawing.
- Project Details and Logos
  a. Each drawing shall include the logos and names of the companies involved in the project. The order and size of these shall be coordinated with the Owner.
  b. Each drawing sheet shall include the project name as defined in the Contract Documents.
- Drawing Title
  a. Each drawing shall have a drawing title, which clearly describes the contents of the drawing. Drawing titles shall, to the extent possible, identify sub-system naming, building sections, floor levels, and/or PLC numbering.
- Drawing Number
  a. Each drawing shall have a unique drawing number following a drawing numbering convention coordinated and approved by the Owner.
  b. When several sheets form part of the same drawing each sheet shall be uniquely identified and the total number of sheets for that drawing shall be clearly identified.
- Revision Indicator
  a. Each submission of each drawing shall contain a revision number or letter.
  b. The revision number shall be updated every time a drawing has been changed since the last submission.
  c. Changes made in the drawing shall clearly be identified using "clouding" around the area of the drawing that has been changed since the last submission.
- Revision History
  a. Each drawing shall have part of the title block contain a tabular list of revisions of that particular drawing. The list shall clearly identify each change made to the drawing and the particular revision the change was executed.
- Electronic File Name

a. The drawing shall include the file name of the electronic version of the drawing.
b. When drawings are stored in folders and sub-folders the relevant path details shall be provided as part of the electronic file name.

- Date
  a. Each drawing shall contain information specifying the date the drawing was completed. The date format used shall follow the Owner's convention.
- Drawn/Prepared By
  a. Each drawing shall contain information specifying the person who prepared the drawing for submission.
- Approved By
  a. Each drawing shall contain information specifying the person who reviewed and approved the drawing for submission.
- Scale
  a. Drawings shall be to scale following industry standard drawing scales, and the applied drawing scale shall clearly be identified as part of the drawing title block.
- Parts List
  a. Drawings depicting assemblies and manufacturing details shall contain a parts list detailing the different parts and components included and their quantities.
- North-South Direction
  a. Each drawing shall contain a clear indicator of true North direction.
- Key Plan
  a. Each drawing shall contain a reduced size overview of the complete airport/terminal grounds with the project defined sector numbers.
  b. The specific sector, which the particular drawing covers, shall be identified using a hatching or other means of identification.
- Grid Lines & References
  a. Each drawing shall include building grid lines and grid line balloons as defined by the Owner.
- Floor Designation and Elevation
  a. Each drawing shall include a base elevation reference and floor designations for each floor level above base elevation.
- Architectural Details & Other Trades
  a. Each layout, elevation and section drawing shall contain the relevant architectural details superimposed as part of the CBIS/BHS technical drawing such that it is possible to identify interferences with the building or other trades.
  b. Section and elevation drawings shall show vertical clearances between CBIS/BHS equipment and building structure and other trades.
  c. The architectural details and engineering details from other trades as part of coordination drawings shall use a line thickness and weight less than the CBIS/BHS details.
- Equipment Identification
  a. Each equipment component and sub-system shall be provided with unique identification according to the agreed naming convention.

D. Professional Engineer (PE) Requirements
   a. The BHS Contractor shall at his own cost engage a Professional Engineer (PE) to design, review, verify and certify for compliance to all code and specification requirements for all CBIS/BHS required work including necessary temporary works and supports.

b. The PE shall be licensed in the jurisdiction where the work is to be completed.
c. The BHS Contractor shall submit any additional signed and sealed drawings, calculations and submissions required by local, state, or federal codes.
d. As a minimum, the BHS Contractor shall provide drawings, calculations, and submissions signed, stamped, and sealed by a PE.
e. All structural drawings shall be approved by a licensed and registered Professional Engineer (PE).
f.

E. Submission Deliverables

- General
  a. Submit drawings as required for each conveyor system and all of its components, including layout, typical details of assembly, erection, and anchorage.
  b. Included in the drawings shall be the location, type and load of supports and lateral bracing, the location, dimensions and rating of drive units.
  c. Drawings shall identify each part in reference to a Bill of Materials which shall indicate each part name, number, description, quantity, size, gauge, model name and purchase number, component, and reference to detail part drawings or assembly drawing, if required for fabrication.
  d. Assemble drawings into coordinated submittals and all drawings shall be complete, orderly, and applicable to this installation only. Standard drawings properly referenced to assembly drawings are acceptable.
  e. Only drawings stamped with approval by the Owner's representative shall be used for fabrication and installation.
- Drawings
  a. The BHS Contractor shall perform the system design using full scale 3D CAD models that use a fixed, common reference point throughout the project as defined by the Owner. The 3D CAD model shall be built in AutoCAD and the model source file (DWG) shall be submitted to the Owner with every drawing submission and/or upon request.
- Submission Quantities

Table 2: Submission Deliverables

Document Type	PDF Qty	Paper Size	File Format
Mechanical Drawings (AutoCAD/Revit)	1 1	22"x34" 11"x17"	DWG PDF
Electrical GC Drawings (AutoCAD Revit)	1 1	22"x34" 11"x17"	DWG PDF
Electrical CBIS/BHS Drawings (AutoCAD)	1 1	11"x17" 11"x17"	DWG PDF
Documents/Reports (MS Word)	1 1	8.5"x11" 8.5"x11"	DOC PDF
Calculations and Lists (MS Excel)	1 1	8.5"x11" 8.5"x11"	XLS PDF
Presentations (MS PowerPoint)	1 1	8.5"x11" 8.5"x11"	PPT PDF
Catalogue Cuts (Mechanical/Electrical)	1	8.5"x11"	PDF

- Mechanical/structural
  a. All structural attachment details for the BHS.
  b. All design computations for the BHS.
  c. All structural support details for the BHS.

d. All structural support computations for the BHS.
e. Structural drawings and computations of all structural attachment points to the building. Include imposed load on the building.
f. Drawings detailing all structural attachment types and supports and the locations (generic details are not acceptable for this purpose).

- Electrical
  a. All new and modified BHS PDPs.
  b. All MCP connected load calculations.
  c. All system design layouts and sections shall be derived from the BHS Contractor's full scale 3D CAD model of the complete Works to ensure design accuracy such that interferences are identified, and prober coordination can be performed. The drawings shall contain sufficient detail to accurately depict the design including, but not limited to, the following.
  d. Detail drawings such as structural support drawings, mechanical and electrical installation drawings and some electrical layouts can be 2D drawings when such details are not included in the full-scale 3D CAD model.
- General Arrangements / Layouts (Plan Views)
  a. Mechanical general arrangement isometric drawings
  b. Mechanical general arrangement layout of the system including equipment segmentation.
  c. Positioning of motors.
  d. Positioning and maintenance access envelope for provision of future screening machine.
  e. Location of maintenance platforms, stairs, ladders, crossovers, etc. (as applicable).
  f. Position of impact protection and bollards
  g. Location, positioning, and access to MCP's.
  h. Maintenance access and escape routes
  i. Operator access and escape routes
  j. Drawings shall include conveyor nomenclature, speed, direction of baggage travel and TOB reference at all changes in elevation as a minimum requirement.
  k. For stacked equipment on top of each other (e.g. double or triple stacked) the BHS Contractors shall develop methodology to easily identify the direction of baggage flow, TOB elevation, speed, nomenclature of each layer of equipment.
  l. A building overlay shall be attached to show in general terms walls, doors, columns, and other structural members.
- Elevations and Sections
  a. Provide elevation and/or section of each conveyor line.
  b. Show the baggage clearance envelope and clear height for personnel.
  c. Include angle of all components, which have changes in elevation including conveyors, stairs, etc.
  d. Device clearances to fixed items (floors, beams) for equipment requiring maintenance including conveyors, doors, diverters, vertical sorters (as applicable), etc.
- Structural/Support Drawings
  a. Provide details of loading on the building and the type of attachment anchor device used.
  b. Provide loading of individual attachments.
  c. Floor support attachments.

d. Vibration isolation attachments and project references for the vibration isolation type proposed.

- Typical Mechanical Installation Details
  a. Guardrails/Impact Protection
  b. Bracketry including attachment/adjustment details.
  c. Hatches and/or panels required in adjacent walls/structures for maintenance access.
  d. Conveyor infill/structure.
  e. Stairs, ladders, crossovers, safety gates, etc.
  f. Sway bracing.
  g. Conveyor side guard cutouts as applicable for maintenance access (crossovers, removable guards), operations access to get to scanners.
  h. Power turns
  i. Queues
  j. Stainless steel cladding details in public view
- Electrical Layouts
  a. E-stop zoning layouts showing the sub-systems uniquely shaded and color coded based on the given E-stop zone. The layout shall show interlocks between zones and location of E-stop push buttons and lanyards. The E-stop zoning shall be superimposed onto the system design model.
  b. Electrical device layout showing placement of electrical hardware including, but not limited to, PEC, shaft encoders, limit switches, safety disconnect switches, control stations, beacons, horns, motors superimposed onto the system design model.
  c. Drawings shall include electrical hardware nomenclature, bag tracking details, encoder locations as a minimum requirement.
  d. PLC control system in block diagram format including data communication between all PLCs, servers, and remote I/O units.
  e. Wire way / Cable tray route layout
  f. Control Station layouts
  g. MCP and power panel layouts
  h. Drawing showing locations and type of safety signage
- Typical Electrical Installation Drawings
  a. MCP and field power distribution panels in relation to mechanical equipment and steel works.
  b. PEC and shaft encoder installation
  c. Soft Starter and VFD installation
  d. Disconnector installation
  e. Control Station installation
  f. E-stop lanyard and push button installation
- Typical User/Operator Interface Drawings (HMI)
  a. Provide detailed HMI operator interface drawings showing relevant ergonomic details such as loading heights, workspace, clear heights, location of control stations, E-stops, and lanyards for the following minimum locations.
  b. All HMI operator interface drawings shall be coordinated with other trades including, but not limited to, building lighting, sprinkler systems, fire, drainage, and building architecture.
  c. All HMI operator interface drawings shall be derived from the BHS Contractor's full scale 3D CAD model and be prepared in 3rd angle projection with dimensions relevant for the ergonomics of the design.
- Minimum HMI Interfaces

a. MCP panels
b. Screening Room

- Motor Control Panel (MCP) Drawings
  a. Provide MCP layouts depicting enclosure size, the type of device utilized, their color, labeling, power requirements, enclosure component general arrangement, and respective placement.
  b. Provide detailed diagram representing the internal layout of all components within each power panel.
  c. Provide details of PLC installation and details of touch screen status monitors.
  d. Provide details of I/O list for each PLC and identify I/O assignments with equipment item numbers.
- Control Station (Operator Panel) Drawings
  a. Provide control station layouts depicting the type of device utilized, their color, labeling, and respective placement.
- Test Plan
  c. The BHS Contractor shall produce a Test Plan which sets out the overall approach, structure, and schedule for testing. The objective of the Test Plan shall be to demonstrate that the requirements have been met for the corresponding design phase as described in the project lifecycle. The Plan shall identify roles and responsibilities for testing plus methods, environments, locations, and resources.
- Test Specifications
  a. A specification shall be produced for each test to be conducted, and each test shall reference the design item within the design documentation which is being tested. The specification shall describe the test to be performed, the test configuration and expected outcome.
- Test Reports
  a. The BHS Contractor shall prepare a test report for each test conducted. The report shall list the results, metrics, any unexpected issues, and non-conformances and shall identify any follow-up actions required with timescales.
- Verification Reports
  a. At the completion of each stage in the design the BHS Contractor is required to produce a verification report to verify that the output of the phase meets the requirements of the previous phase. The verification process shall enable tracking of requirements through each design phase to ensure full traceability and continuity.
- External Interfaces
  a. Provide detail drawings showing all interfaces between the CBIS/BHS and external systems. Such drawing shall include connection type, communication protocol, software protocol, transmission media, location of connections, and other required information.
- Wiring Schematics
  a. The BHS Contractor shall submit his electrical wiring diagrams in AutoCAD file format. The preparation of such wiring diagrams shall be done using a dedicated electrical software program such as E-Plan or similar as accepted by the Owner in order to ensure a high design quality.

F. Operating & Maintenance Manuals

- General
  a. The purpose of the O&M Manuals is to provide operational and maintenance personnel with a thorough understanding of the complete system. This includes the

layout, functionality, special features, contingencies, operational requirements, maintenance requirements, spare parts, warranty information, and safety information.

b. The manuals shall include graphics/pictures/illustrations when possible, to ease the comprehension of the O&M Manual.

c. The BHS Contractor may submit his standard O&M Manual provided such standard documentation provides the information required and documents are suitable for the purpose. The BHS Contractor shall submit a draft version of the proposed O&M Manuals for the review and approval of the Owner. The Owner shall indicate his approval or any comments related thereto and return the draft to the BHS Contractor.

d. The O&M manual shall be divided into two (2) main sections; Operating Instructions and Maintenance Instructions.

e. Each of these sections shall be sub-divided into logical volumes and sections separated by page dividers with properly labeled margin tabs.

- Formatting Requirements
  a. Quantities
     1) For the final O&M Manuals the BHS Contractor shall submit six (6) hardcopies (one (1) original and five (5) copies) and three (3) softcopies of their manual including drawings, appendences and supporting documentation.
  b. Softcopy
     1) The electronic file version and the hard copy version must be identical.
     2) The softcopy shall be provided on a USB memory stick clearly marked with the project and details of the proposal.
- Operating Instructions
  a. The operating instructions shall describe how personnel shall operate the system in a safe and efficient manner. The descriptions shall cover normal operations, special circumstances, fallback, and contingency operation.
  b. The contents of the manual shall be easy to understand for personnel not familiar with the system and provide sufficient detail and explanation to make such personnel able to operate the system upon reading the operating instructions.
- Maintenance Instructions
  a. The maintenance instructions shall describe how personnel shall maintain the system in a safe and efficient manner. The descriptions shall cover routine inspections, servicing activities, scheduled maintenance and break-down repair activities, and typical trouble shooting.
  b. The contents of the manual shall be easy to understand for personnel not familiar with the system and provide sufficient detail and explanation to make such personnel able to maintain the system upon reading the operating instructions.
  c. Provide maintenance schedules and procedures.
     a) Lubrication details including frequency and type of lubricant (recommended supplier).
     b) Maintenance schedule for all components in the CBIS/BHS identifying frequency grouped by the following disciplines;
     2) OEM Literature
        a) Include brand specific OEM manufacturer's literature, sources of purchase and similar information including, but not limited to the following;
     3) As-Built Drawings

a) Exploded view isometric drawings, diagrams and photographs shall be provided in addition to step-by-step disassembly and assembly instructions.
b) Illustrated parts detailing graphically (exploded views) and numerically (quantity, suppliers part number, etc.) the components in each major assembly.
c) Provide a full set of the As-built drawings.

4) Spare Parts List
a) Final Spare Parts List

d. Provide troubleshooting and fault isolation procedures.
1) Troubleshooting Content
a) The troubleshooting guides shall be provided in a chart format, where personnel can identify the trouble experienced, it probable cause and associated corrective action.

e. Provide name, address, telephone numbers, fax numbers, email, cell phone numbers of the BHS Contractor, suppliers, installers along with manufacturers nearest representatives.
f. Provide copies of guarantees and warranties issued to, and executed in the name of, the Owner. Provide details of warranty period and procedures for return faulty items under warranty.
g. Provide empirical reading results of the acceptance testing as a reference for maintenance personnel.
h. Provide inspection and adjustment procedures.
i. Provide pre-operating procedure.
j. Provide start-up and shut-down procedures.
k. Provide equipment lock-out and tag-out procedure.
l. Provide removal, disassembly, re-assembly, and installation procedures. Such information shall be brand specific for the equipment used.
m. Provide test procedures to verify the adequacy of repairs.
n. Provide calibration procedures.
o. Provide details of where measurements are to be made.
p. Provide list of special tools and test equipment required for the operation, maintenance, adjustment, testing and repair of the equipment, instruments, and components.
q. Provide scale and corrosion control procedures.
r. Provide torque values, belt and drive chain tensioning procedures and values.
s. Provide component lists for all major equipment components.

G. Periodic Maintenance Inspection and Lubrication Chart

- The BHS Contractor shall besides the O&M Manuals provide a standalone master chart or series of charts illustrating the recommended periodic maintenance inspections, lubrications, and component replacements.
- The chart(s) shall contain cross-references to the O&M Manual for the specific detail procedures.

H. Spare Parts List

a. The BHS Contractor shall present a proposed list of spare parts for the CBIS/BHS for review by the Owner.

b. The list shall include all components and parts for mechanical, electrical and control items, which are subject to wear and tear and/or failure. The spare parts list shall also include any type of consumables such as oil, oil pads, CBRA swipes, and so on.
c. The list shall be arranged in separate divisions based on the necessary spare parts to support the CBIS/BHS for the following periods:

- Divisions of Spare Parts List
  a. Spares needed for the BHS Contractor's Warranty Period.
  b. Spares needed for the first five (5) years of operation of the system.
     1) Each division of the list shall be separated into two (2) sections; Proprietary parts manufactured by the BHS Contractor and parts supplied by OEM suppliers.
     2) The list shall be categorized by the following sub-sections. Provide summary totals for each section, division, and a grand total for the entire list.
  c. Spare Part Categorization
     1) Mechanical components.
     2) Electrical components.
     3) Control components (LLC)
     4) Miscellaneous (any other items that do not fit into the above categories).
        a) As a minimum, the list shall include the following information for all sections, categories, divisions, and all parts.
- Contents of Spare Parts List
  a. Part category
  b. Description of part/component.
  c. Part number
  d. Unit price, current for a minimum period of twelve (12) months after Final Acceptance.
  e. Recommended stock levels
  f. Minimum stock levels
  g. Line-item total price (unit price multiplied by the recommended quantity).
  h. Maximum delivery time (lead time)
  i. Maximum repair time
  j. Total quantity of type installed in the CBIS/BHS by the BHS Contractor (feet /pieces)
  k. Storage area required for the part (ft^3)
  l. Type: Consumable or wear/tear part
  m. Classification: Component, part, or assembly
  n. OEM Manufacturer name
  o. OEM Manufacturers part number
- OEM Manufacturer Details
  a. Address
  b. Phone number
  c. Contact person.

I. Training Material
   a. Submit training material for review and approval by the Owner.
   b. Schedule detailing each discipline, date of training, start and end times.
   c. Reference material.
   d. Personal operations workbook.

e. Reference material shall include all manuals relating to any equipment and or operation being trained on, including but not limited to the following;

- Reference Material
  a. Operations and maintenance manual.
  b. Detailed drawings included exploded views.
  c. Operations workbook.
     1) A workbook shall be provided to each person being trained.
     2) Workbooks shall include exercises detailing the exact operation/functions required to complete a task (e.g. clearing a Jam).
     3) Pictures/photographs of a typical installation shall be included (jam operator station).

J. Operations Software
   a. Source code for all software that was custom designed/built or customized for the project shall be provided to the Owner.
   b. The BHS Contractor shall submit to the Owner ten (10) days prior to Practical Completion of the system and/or ten (10) days prior to Final Completion and Acceptance by the Owner whichever occurs first, the following items;

1.8 General Requirements (Non-Functional Requirements)

A. Life Expectancy
- The system shall have a life expectancy of a minimum of twenty (20) years with the herein defined system availability. It must be guaranteed that the appropriate application of low levels of routine servicing and maintenance will ensure the specified service life for the entire system.
- The BHS Contractor shall ensure that mechanical and electrical components and the installed control system will be available and also expandable during the service life of the system.
- Individual components shall have a minimum life of fifty thousand (50,000) hrs. or six (6) years of operations, whichever occurs first based on an approved maintenance cycle of no more than three (3) months unless an alternative maintenance cycle is specified in the Maintenance Manual and brought to the attention of the Owner at time of proposal.

B. Expandability and Flexibility
   a. The mechanical, electrical/power, control and computer systems must be designed in such a manner that they can be easily expanded and reconfigured in the future without the need to completely replace the provided components under this Contract.
   b. Overall controls must cater for minimum forty percent (40%) expansions, i.e., through addition of new sub-systems beyond this Contract, and twenty five percent (25%) reconfigurations, i.e. modifications and/or add additional equipment within the provided sub-systems of this Contract. For example, in the event that the design is based on ten (10) sub-systems (includes all defined future provisions) the Owner shall be able to add an additional four (4) sub-systems without the need to upgrade the architecture.
- Motor Control Panels (MCP)
  a. Each MCP installed shall have a minimum of twenty-five percent (25%) of usable spare space after project completion to allow for expansion.

b. The BHS Contractor shall pay special attention in the case of areas which involve single components (power supplies, etc.) such that additional components can be installed as required.
   1) Spare Main Switch
      a) The BHS Contractor is required to provide each MCP main switch with twenty-five percent (25%) spare capacity or ensure that there is sufficient space available in the MCP to upgrade and install a bigger main switch.

C. Maintainability
- The BHS Contractor shall provide components that are maintenance free and lubricated for life, where possible.
- All installation shall be done in a way that provides optimal accessibility for maintenance and repair purposes.
- Equipment shall be designed with preference to reliability and maintainability rather than ease of manufacture.

D. Reliability
- The system shall be capable of operating continuously without fault.
- The system components must be chosen with the highest possible reliability in mind.

E. Redundancy
- The implementation of redundancy through design must consider mechanical elements as well as the needs of power supplies, control systems, and any other part of the system. Redundancies are always to be regarded as a whole, i.e., covering the mechanical, electrical, and LLC systems.
- Warm Back-up
  a. Provide Warm Back-up for the complete Outbound system.
- Carousels
  a. The carousel shall be fitted with an extra drive for redundancy such that it can continue normal operation and startup at fully loaded condition despite having one (1) failed drive.

F. Equipment Substitution (RFS)
- If the BHS Contractor during the execution of this Contract obtains access to new unproven equipment, which the BHS Contractor wishes to utilize for this Contract, the BHS Contractor shall submit a Request for Substitution explaining the following:
  a. OEM History in use
  b. Operational and maintenance disadvantages/advantages
  c. Cost implications.
  d. Explanations on choice for request
  e. Schedule Impact
- The BHS Contractors shall as part of the Request for Substitution provide documentation of his rigorous in-house testing and proof of the proposed equipment's reliability.

1.9 Key Performance Indicators (KPI)

A. General

- Individual system elements and components have to handle considerably larger peak demands than the overall throughput requirement defined below.
- The performance requirements must be attained, as an absolute minimum, without fail and form part of the acceptance testing.
- The CBIS/BHS must be capable of continuous operation at full capacity, i.e., must be able to tolerate any number of daily peaks.
- All performance requirements always refer solely to the system technical performance, i.e., the time required for the function and operation of the equipment/component alone. Any Operator imposed time is not included.

B. Component Throughput Criteria

- The following table shows the minimum throughput criteria for individual components, which are to be met or exceeded by the BHS Contractor. It is required that individual equipment components and elements can process considerably higher loads than the individual line throughputs in order to achieve the system design throughput defined above.
- The operational sort-rate of individual components such as diverters, vertical sorters, merges, and other associated equipment must be maximized. This must be done while still maintaining reliable and gentle transport of baggage.
- The BHS Contractor shall demonstrate to the Owner that the individual throughput requirements below are met or exceeded every minute for fifteen (15) consecutive minutes of operation.
- Values below are not cumulative.

Table 3: Equipment Component Throughput Requirements

System Area	Peak 15-min Throughput [bpm]*	Sustained Hourly Throughput [bph]**
Ticketing Take-Away Conveyor	25	1275
Transport conveyor (tracked/non-tracked)	40	2040
Transport conveyor from Screening (cleared bags)	25	1275
Queue Conveyors (metering)	60 start/stop operations/min	2550

- * This rate shall be achieved every minute and sustained for a continuous period of fifteen (15) minutes.
- ** This rate shall be achieved and sustained for a continuous period of sixty (60) minutes. This rate is approximately 85% of the peak 15-min throughput to allow for system variations and bag transition delays.
- A “cycle” is defined as the travel from “home to divert to home” position.

C. Equipment Speeds

- All equipment speeds and performance standards always refer solely to the system’s technical performance, i.e., the time required for the function and operation of the equipment/component. Any operator-imposed time will not be included, for example in the manual loading of odd size trays.
- It is the BHS Contractor’s responsibility to design, install and commission the CBIS/BHS equipment using equipment speeds from the contract drawings, while ensuring that the system performs to the specified criteria without jams, bottlenecks, excessive wear, noise, and vibration under full load conditions.

- The transitions in belt speeds between any two (2) consecutive belts shall not exceed 30 ft/min or ten percent (10%) between adjacent equipment components, whichever is greater so as not to affect the stability, orientation, or spacing of bags, while still maintaining accurate bag tracking and minimize the risk of bag jams.

1.10 Design Requirements

A. General

- The BHS Contractor shall ensure that the engineering design requirements defined in these Specifications are included and described in the submittals provided to the Owner for review and approval.
- The BHS Contractor shall provide components, parts, and equipment to match existing installation(s) and spare-parts inventory. In the event that parts and equipment have been superseded or replaced with newer models, the BHS Contractor shall detail this replacement/substitution and make sure that such replacements are compatible with all local and overall controls and systems.
- Design all parts and sub-assemblies in accordance with good commercial practice and assure safe, efficient, and practical design in keeping with requirements peculiar to this type of system.
- The baggage shall not be subjected to any damage. The design, manufacture and installation shall be to eliminate such damage to bags.

B. Design Coordination

- No additional costs shall be considered for coordination activities throughout this project. The BHS Contractor shall in his proposal include all costs for coordination of all activities.
- Prior to fabrication or installation of any Works, participate in detailed coordination planning meetings with all other building utilities system trades, under the direction of the Main Contractor, so as to completely establish routings, elevations, space requirements, and coordination of access, layout, and suspension requirements in relationship to the building structure and the Works of all other trades.
- Ensure that sprinkler pipes and drainage pipes are running along and parallel with CBIS/BHS equipment rather than across CBIS/BHS equipment unless the required clear height for baggage and personnel is maintained.
- Coordinate and install all sprinkler requirements for sprinklers both above and below CBIS/BHS equipment to satisfy fire codes. E.g., double-stacked lines, solid surface or otherwise as defined by fire codes.
- Coordinate and install all sprinkler requirement for special and additional sprinklers in areas with high concentrations of flammable materials or congested CBIS/BHS equipment. E.g., as defined by fire codes.
- If an EDS machine is provided by TSA during this project, Coordinate with the EDS device provider as required to provide the necessary interfaces between the CBIS/BHS and EDS in order to successfully accomplish the intended operation described herein. The BHS Contractor shall, in all cases, be responsible for any wiring between the CBIS/BHS and EDS that are required for the interfaces.
- Comply with the TSA planning guidelines in force at the time of the contract award in all areas unless specific exceptions have been granted at time of award.
- All dimensions on structural drawings shall be field verified and checked against the architectural drawings. Any discrepancies shall be reported to the Owner immediately. In

case of conflict between notes, details, plans, and specifications, the most rigid requirements shall govern until such time as a clarification is issued by the Owner.

C. Baggage Characteristics

- Bag Types
  a. The system must be able to handle all types of bags (without exception) experienced in modern airports. This includes, but is not limited to, hard-cases, soft-cases, crates (wood, plastic, steel, aluminum, etc.) back-packs, plastic bags, paper-wrapped boxes, cardboard, plastic, nylon, wood, steel, aluminum, canvas, cotton, or other materials commonly used for baggage.
  b. The system must be able to handle straps, handles, tags, banding, wraps, as commonly seen on baggage without causing jams.
  c. The use of plastic film for wrapping bags to prevent theft shall not pose any degrades in the handling and processing of such bag and it shall not be necessary to place such bag in a baggage tub.
  d. The system must be able to handle baggage in airline tubs.
- Normal In-gauge (IG) Bags

Table 4: Normal Baggage Characteristics

Characteristic	Minimum	Maximum
Weight	2 lbs.	72 lbs.
Width	3”	36”
Height	3”	36”
Length	9”	72”

- Oversize (OS) Bags

Table 5: Oversize Baggage Characteristics

Characteristic	Minimum	Maximum
Weight	5 lbs.	120 lbs.
Width	5”	40”
Height	5”	34”
Length	12”	98”

D. Baggage Clearances

- Maintain a minimum of 36” baggage clearance from the top of the conveyor belt (TOB) to the nearest overhead obstruction. The BHS Contractor is responsible for ensuring that this is maintained throughout the installation and equipment from other trades does not conflict with this requirement.
- The BHS Contractor shall pay special attention and ensure sufficient baggage clearance is provided at changes in elevations such that a maximum size bag can be transported without obstruction. The BHS Contractor shall denote on their coordination drawings any additional clearances required to properly transport a maximum size bag without any obstruction.

E. Operational Clearances

- Maintain a minimum of 8’-6” clear from finished floor level to the nearest overhead obstruction throughout all baggage cart traffic aisles/routes. The BHS Contractor is responsible for ensuring that this is maintained throughout the installation and equipment from other trades does not conflict with this requirement.

F. Dynamic Load

- All drives shall have a motor/reducer sized to permit start up under full load conditions as per specified loads and start/stop cycles.

Table 6: Dynamic Load Requirements

Equipment Type	Dynamic Load
Conveyors capable of containing only a single bag	72 lbs. per conveyor
Conveyors capable of containing more than one (1) bag	40 lbs. per linear foot proportional to a speed of 90 fpm
Flat plate carousels	40 lbs. per linear foot of center line carousel
Stairs/ladders	75 lbs. per linear foot

G. Static Load

Table 7: Static Load Requirements

Equipment Type	Static Load
Conveyors capable of containing only a single bag	150 lbs. per linear foot or a single concentrated load of 300 lbs.
Conveyors capable of containing more than one (1) bag	75 lbs. per linear foot or a single concentrated load of 300 lbs.
Flat plate carousels	150 lbs. per linear foot or a single concentrated load of 300 lbs.
Stairs/ladders	75 lbs. per linear foot

H. Changes in Elevation

- All changes in elevation shall be kept to a minimum and comply with the following maximum requirements.

Table 8: Maximum Changes in Elevation

Equipment Type	Comment	Slope
Belt Conveyor	Non-tracked inbound (arrival) transport	+/- Eighteen degrees (18°)
	Non-tracked outbound transport outside TSA areas	+/- Eighteen degrees (18°)
	Tracked outbound transport outside TSA areas	+/- Twelve degrees (12°)
	Non-tracked lines within TSA areas (CBIS/BHS and CBRA)	+/- Fifteen degrees (15°)
	Tracked lines within TSA areas (CBIS/BHS and CBRA)	+/- Twelve degrees (12°)

I. Seismic Zone

- All equipment, header steel, hangers, supports and other equipment that spans across seismic zones shall be installed in accordance and be fully compliant with all Local, City & County, State and Federal seismic codes and approved by the Owner.
- The BHS Contractor shall in the design consider seismic requirements and accommodate the building expansion zones.

J. Baggage Separation

- Baggage separation techniques shall be capable of separating bags, which overlap by not more than 6" side by side. This shall be achieved by mechanical methods through speed differentials between adjacent conveyors.
- The bag separation shall be maintained on all tracked lines to allow accurate bag tracking.

K. Paint Colors & Finishes

- The exterior color of the CBIS/BHS equipment shall be coordinated with the Owner and approved in writing before the BHS Contractor commences any manufacture or construction. If the BHS Contractor has more than one shade of the colors defined below, the BHS Contractor shall provide choices to the Owner for approval.
- The exterior color of the CBIS/BHS equipment shall match existing equipment and be coordinated with the Owner and approved in writing before the BHS Contractor commences manufacturing.

Table 9: Equipment Coloring

Equipment Type	Comment	Color
Outbound Belt Conveyor	BHS Contractor to submit color for Owner approval.	TBC
Inbound Belt Conveyor	BHS Contractor to submit color for Owner approval.	TBC
Safety guarding, bearing covers, handrails and guardrails, bollards, drip pans.		Safety yellow
All equipment in public view	Stainless steel material brush #4 finish	SS

L. HMI Ergonomic Requirements

- The BHS Contractor shall in his design ensure that the following requirements are fulfilled in order to provide the desired ergonomics and work conditions when personnel interact with the CBIS/BHS.

Table 10: HMI Ergonomic Requirements

CBIS/BHS Work Area	TOB Above Operator Work Level	Sideguard	
		Operational Side	Non-Operational Side
Ticketing Take-away Belt	13"	None	21"
CBRA worktable	30"	N/A	N/A
CBRA Clear Line	28"	None	12"
Make-up Carousel / Runout Line	30"	None	21"
Flat Plate Claim Carousel without Feeder	18"	21"	7"-10"
Flat Plate Claim Carousel with Feeder	12"	21"	7"-10"
Personnel Crossovers/bridges	N/A	6"	N/A

- The distance that TSA personnel must transport baggage within CBRA is to be minimized at all times and shall at no circumstance exceed 8'.

M. Unload Areas

- Single-sided unloading areas shall be provided with standard sideguards on the non-operational side. Motor and gearboxes shall be placed on the non-operational side of the conveyor.
- The front of the conveyor shall be adequately guarded so that there are no catch points for clothing and/or baggage, e.g., by having a piece of wood or steel along the frame of the conveyor.

N. NEMA & IP Rating
- All panels, control stations, racks and other protection for electronics and power equipment shall be rated at minimum NEMA 12.
- Areas under direct water exposure or risk of shall be rated NEMA 3.

O. Power Provisions
d. The BHS Contractor shall, on his drawings, show the electrical power requirements (amperage) at each of the power panels. Each sub-system shall be independent and shall be provided with its own power panel.
a. The BHS Contractor shall calculate his power loads to each sub-system and verify the feeder sizes shown on the Contract Drawings for review and approval of the Owner.
b. From the MCP panel, the BHS Contractor shall furnish and install all services, feeders, and fused disconnects for branch circuits to each control panel as specified and shall provide and install all panels boxes, wire-ways, conduits, conductors, transformers, fuses, equipment, and materials required to complete the electrical power distribution for the operation of the system.
- EDS Machines
a. The BHS Contractor shall coordinate with the EDS supplier and install power from the main switch to the EDS machine (via UPS or power conditioner as necessary).
b. The BHS Contractor shall coordinate with the EDS machine installer for connection to the EDS, testing and energizing.
c. The BHS Contractor shall provide fiber/data cabling and junction boxes for each potential EDS machine. Coordinate with the EDS OEM for location, type, and quantity.
- Motor Control Power
a. All motor control power shall be 480 VAC.
- Low Level Control Power
a. The LLC shall use 24 VDC or 120 VDC depending on LLC application.

P. Grounding
- The equipment and its installation shall be completely grounded for all sources of energy including protective grounding and potential bonding to equipment.
2. The connection between ground and the power-supply equipment (generator or transformer) shall be a direct connection with ground. The connection between ground and the electrical device being supplied shall be a direct connection with ground.

Q. Minimum Equipment Controlled by VFD
- The BHS Contractor shall provide the equipment marked in the BHS Conveyor Manifest Drawings from the Contract Drawings with VFD controllers and suitably matched motors and gear boxes.

1.11 Verification & Acceptance of the Works

A. General
- It is necessary to establish a systematic, carefully documented process to monitor and record the progress of verification and acceptance. Such a systematic process is the purpose of the System Acceptance.

- The Owner will accept the system when all aspects of the system have been verified to comply with the requirements of the Contract Documents. As specified hereafter, verification will be accomplished by analysis, inspection, and testing.
- The following table provides an overview of the verification and acceptance activities:

Table 11: Verification and Acceptance Activities

Period	Activity
Design & Manufacturing	"Analysis" "Qualification Testing" (verifying design of components or sub-systems)
Installation	"Inspections" and "Construction Testing"
System Acceptance Testing	"System Performance Tests" "System Acceptance Tests" "Functional Tests" "System Demonstrations" "Completion of outstanding Works (Punch List)" "Training" "Airport Operational Readiness Tests" "Practical Completion"
Start-up System Monitoring & Support	"Beneficial Use" "Substantial Completion" "Defects Liability Period" / "Warranty Period" "Start-up System Monitoring & Support" "System Performance Compliance Report" "Final Completion and Acceptance"
Operation & Maintenance	Remaining O&M period beyond "Start-up System Monitoring & Support" period.

B. Design & Manufacture

a. During the Design and Manufacturing periods the following activities shall as a minimum, but not limited to, from part of the verification and acceptance of the Works.

- Analysis

1) Analysis is the review of design data, test data, or other data describing the design and/or function of the CBIS/BHS, its sub-systems, assemblies, and components. Analysis includes the review of engineering drawings, engineering reports, and test reports, including identification of national standards and/or codes, which an item meets.

2) Analysis is the method of verification used when rigorous testing is impossible or impractical because of the required environmental or other conditions needed to conduct a realistic test.

b. Qualification Testing

1) Qualification testing is the controlled testing of individual components or elemental assemblies, prior to incorporation into fabricated parts of the Works, for the purpose of verifying that the design of the tested item satisfies the requirements of the Contract. Through satisfactory qualification testing, basic designs for the project are qualified as meeting specified performance and/or other parameters and are thereby accepted for utilization and incorporation in manufactured and constructed parts of the Works.

2) BHS Contractor's In-House Testing

a) The BHS Contractor shall perform in-house factory testing of parts, assemblies, and sub-systems whether mechanical, electrical, controls or software based prior to shipment to the site to check and establish proper individual operation.
b) Prior notification to the Owner of in-house factory tests is not required unless as a result of design review or other information, the Owner requests to be notified.
c) The Owner shall, however, have the right to witness any factory tests, conducted for whatever purposes, if such test is material to the BHS Contractor's performance of this Contract.
d) It is the intent of this Section to present the general scope of factory testing to be conducted by the BHS Contractor, but not to prescribe exact methods for conducting such tests. The BHS Contractor may use established test procedures for conducting the factory tests where such procedures are appropriate to meet the Contract requirements.

C. Installation

a. During the installation period the following activities shall, as a minimum, but not limited to, form part of the verification and acceptance of the Works.

- Inspections

a. Inspection is the examination of specific physical elements of the CBIS/BHS, its sub-systems, assemblies, and components and Works under way.
b. Inspection may include the taking of specific static measurements such as length, width, or height where simple measuring devices are used.
c. In cases where physical inspection of specific assemblies or components is not possible because of manufacture or construction, inspection is carried out by the review of reports of previously conducted inspections.
d. Inspections may be carried out in combination with other verification methods, such as testing, where visual observation as well as the taking of measurement data is necessary to verify a particular requirement.
e. Inspection of construction materials, samples of materials and sub-construction assemblies shall be conducted as construction proceeds at the site to check and establish that construction plans, and Specifications are met.
f. Inspection of materials and subassemblies used in the BHS Contractor’s Works shall be conducted by the BHS Contractor, supplier, or specialty sub-contractor to verify that the installed materials meet or exceed the Contract requirements.
g. The Owner, his representative or the Main Contractor may perform inspections to verify quality, progress and/or compliance with the Contract requirements and report any deviations to the BHS Contractor for his immediate rectification.

D. System Acceptance Testing

a. During the System Acceptance Testing period the following activities shall, as a minimum, but not limited to, form part of the verification and acceptance of the Works.
b. Upon completion of the BHS Contractor’s commissioning activities and commencement of System Acceptance Testing with the Owner, the BHS Contractor shall stipulate to the Owner that the system is compliant with the Contract Documents.

c. The BHS Contractor shall in cooperation with the Owner maintain a detailed Punch List detailing all defects found through the System Acceptance Testing activities. The BHS Contractor shall rectify all defects on the Punch List.
d. The Owner shall have the right to add items to the Punch List. These shall be communicated to the BHS Contractor through progress meetings, test observations or general project correspondence.
e. The Punch List shall contain information about each defect item, including, but not limited, to the following:

- System Performance Testing
  a. After the BHS Contractor has performed the commissioning activities defined in Period 3 Commissioning and have determined that the equipment and systems are performing properly, the BHS Contractor shall plan, execute and document System Performance Tests in accordance with the accepted System Acceptance Plan to verify Contract compliance to the Owner.
  b. The Owner shall have the right to define the content and objectives of the acceptance test procedures for System Performance Tests, however the BHS Contractor is responsible for the planning, execution, and documentation of System Performance Tests. For each test, the attendees shall be recorded and form part of the test documentation.
  c. The BHS Contractor shall carry out the necessary preparation and pre-test runs prior to conducting acceptance tests with the Owner to ensure that acceptance tests conducted with the Owner and/or his representative are successful as specified in the Contract and agreed test procedures.
  d. It is the Owners who solely determine if a test passes or fails based on the pre-defined test criteria in-line with the Contract Documents. It is the BHS Contractor's responsibility to prove to the Owner that tests pass through the documentation of test observations, test results, log files, and posttest analysis/investigation under close monitoring and cooperation with the Owner.
  e. With the submission of the test results to the Owner, the Owner will maintain a summary list over passed, failed and outstanding tests.
  f. A part of the System Performance Tests shall include the System Demonstration.
  g. The BHS Contractor shall rectify all Punch List items identified during the System Acceptance Testing within fourteen (14) calendar days of completion of the System Acceptance Testing. Under no circumstances shall defects and Punch List items affect live operation or jeopardize personnel, system, or equipment safety.

E. Start-up System Monitoring & Support

- During the Start-up System Monitoring & Support period, which commences with the live operation and beneficial use of the system the BHS Contractor shall provide monitoring and support as defined in Part 3.

1.12 Spare Parts

A. General

- The BHS Contractor shall establish and continuously keep spare parts records, for each stock item, where dates and times of parts introduced, used, replaced, exchanged, withdrawn; checking, maintenance, inventory carried out; and any notes or observations are specified. The spare parts records shall be made available to the Owner at any time upon request.

- The BHS Contractor shall, as defined in the requirements for submittals, prepare and submit his recommended spare parts list taking the guaranteed reliability into account.
- The BHS Contractor shall establish and submit to the Owner detailed spare parts lists, for each stock item, indicating item identification, description, date of inclusion (based on revision), and number of units of all spare parts included in the spare parts stock.
- All spare parts provided shall be new. No refurbished parts are acceptable.
- Spare parts purchased by the Owner shall be furnished on-site within the lead time listed and agreed in the spare part list.
- The Owner or his nominated O&M Service Provider shall manage the inventory of non-warranty spare parts from the date of receipt of inventory by the Owner.

1.13 Parts Availability

A. BHS Contractor's Manufactured Equipment
- The BHS Contractor shall ensure that all components used including non-standard customized and proprietary parts shall be readily available for immediate delivery to the Owner throughout the lifetime of the system. If the BHS Contractor cannot comply with this requirement or should the price become unreasonably high, the BHS Contractor shall provide the Owner with all required manufacturing and assembly drawings and details for the Owner to have such parts manufactured by a 3rd party.
- The BHS Contractor shall guarantee the functionality, connect ability and interchangeability of spare parts from alternative sources of supply.

B. OEM Manufactured Equipment
- The BHS Contractor shall ensure that all OEM components used including non-standard customized and proprietary parts shall be readily available for immediate delivery to the Owner throughout the lifetime of the system. If the BHS Contractor cannot comply with this requirement or should the price become unreasonably high, the BHS Contractor shall provide the Owner with alternative equipment at no additional cost to the Owner.
- The BHS Contractor shall guarantee the functionality, connect ability and interchangeability of spare parts from alternative sources of supply.

C. Software
- The BHS Contractor shall ensure that there is a valid backwards compatible path for all software throughout the lifetime of the system.

1.14 Special Tools

A. General
- The BHS Contractor shall provide all special tools needed to perform the operation, service, and maintenance of the system.
- The following minimum tools shall be provided as part of the BHS Contractor's scope of supply:
- List of Special Tools
  a. One (1) belt lacer sufficient to maintain any installed belt
  b. One (1) tachometer to determine belt speeds including calibration certificate (configurable for ft/min and m/s)

c. A minimum of one (1) control stations for configuration of VFD parameters
d. Any special tool required to service any equipment provided

1.15 Training

A. General
- The BHS Contractor shall provide operational and maintenance training as defined in this Specification.

1.16 Warranties

A. General
- The BHS Contractor shall warrant the CBIS/BHS equipment for one (1) year against defective parts and labor and shall warrant all CBIS/BHS equipment for five (5) years against defective design, starting on the date of Final Acceptance of the Works.
- The BHS Contractor shall submit two (2) copies of written Warranty, signed by the BHS Contractor, Installer and Designer/Manufacturer, agreeing to repair or replace defective materials and workmanship during the Warranty period.
- Replace, at no additional cost to the Owner, any Works, materials, or equipment, which evidences defects in design, construction, or workmanship within the warranty period.
- Excessive wear shall be considered a defect within the provisions hereof.
- The BHS Contractor shall transfer all warranties to the Owner for materials and equipment received from Sub-Contractors and Suppliers at or before Final Acceptance.

B. Parts and Labor Warranty
- Provide a parts and labor warranty, which states that the BHS Contractor will proceed with and perform the Works in the best and most workmanlike manner and that the System, materials and equipment furnished and installed will be new and free of defects in materials, workmanship, installation, or incorrect component selection. It will also state that the functionality and technical requirements as specified in these Specifications and Contract Documents have been complied with.
- Any equipment replaced or found defective under the Warranty period that requires a substitution, design change, or modification shall be warrantied as required. All equipment of same type, make, model, etc. shall also receive the same substitution, design change, or modification as part of the BHS Contractor' warranty responsibility.
- Any warranty items requiring substitution, design change, or modification during the Warranty period shall deem the Warranty period to start over from the date the last piece of like equipment was replaced under Warranty.
- Warranty Exclusions
  a. This warranty shall not apply with respect to any defects or unsuitable application which is attributed to repair, alteration, misuse or abuse by any person other than the BHS Contractor's personnel or designated Sub-Contractors. The BHS Contractor's liability shall be limited to repairing or replacing defective or non-performing part(s) at no cost to the Owner.
- Period and Responsibility (Mechanical/Electrical Components)
  a. If within one (1) year from the date of Substantial Completion of the Works or any equipment or material is found in any respect to not conform to the warranty set

forth herein, then the BHS Contractor shall within forty eight (48) hours of notification, commence works to correct and repair or replace the fault and/or malfunction, on-site during non-peak operating periods or at such times the Owner may direct without additional costs to the Owner.

b. The Owner may choose to perform the warranty labor repair work with its maintenance staff at the BHS Contractor's expense. The BHS Contractor shall provide labor for Works related to design deficiencies.

- Period and Responsibility (Controls/Software/Database)
  a. If within one (1) year from the date of Substantial Completion of the Works or any equipment or material is found in any respect to not conform to the warranty set forth herein, then the BHS Contractor shall in accordance with Off-Site Support requirements defined in Part 3 § 3.24C, commence works to correct and repair or replace the fault and/or malfunction, on-site during non-peak operating periods or at such times the Owner may direct without additional costs to the Owner.
  b. The Owner may choose to perform the warranty labor repair work with its maintenance staff at the BHS Contractor's expense. The BHS Contractor shall provide labor for Works related to design deficiencies.

C. Design Warranty
  a. A design warranty shall be provided by the BHS Contractor guaranteeing the application and overall system design of the CBIS/BHS to be free from faults and defects in design. The design warranty shall be for a period of five (5) years starting on the date of Final Completion and Acceptance of the Works.

- Design Defect
  a. A design defect shall include product selection, defective materials, workmanship, and installation and is hereby defined to include the following except where incidents are beyond the control of the BHS Contractor, Installer and Designer/Manufacturer:
  b. Component Replacements of the Same Type
    1) More than two (2) failures of the same component within any six (6) months period of use.
    2) More than five (5) failures of the same component across any assemblies within any six (6) months period of use.
    3) More than two (2) unscheduled replacements of a component within the replacement schedule defined in the BHS Contractor's O&M manuals even if the component is a wear and tear part.
    4) Consistent performance below required minimums.
    5) Excessive deterioration and/or aging.
    6) Abnormal wear considering intensity of use.
    7) Unsafe conditions and/or unsafe operation.
    8) Continual leakage/seepage of liquid from a seal or seal(s) of similar components performing similar operation.
    9) Excessive noise, including a noticeable increase in noise after being placed into operation.
    10) Excessive vibration.
    11) Frequent loosening of retaining devices and/or the need to perform frequent adjustment.

12) The Owner is unable to expand the system as defined in the Contract Documents due to limitations in the design. Examples include, but are not limited to:

- Responsibilities of the BHS Contractor
  a. At any time within the five (5) years from Final Completion and Acceptance of the Works, any part of the Works, components or any part of the operating system is determined not to be in compliance with the warranty as described in these Contract Documents, the BHS Contractor, once notified by the Owner of such an issue, will have forty eight (48) hours to begin the necessary procedures to rectify the condition. The BHS Contractor shall as a minimum perform the following activities to rectify the situation:
  b. BHS Contractor Activities
     1) Research the issue and determine the root cause of the failure or issue.
     2) Prepare the necessary documentation for submittal to the Owner for review and comments to be provided to the Owner within five (5) working days of notification. Such documentation shall include work to be performed and a detailed timeline for the BHS Contractor to complete the work and for the Owner to inspect the modifications.
     3) Incorporate the Owner's comments, or proceed, if the Owner approves the remediation proposed by the BHS Contractor within three (3) working days following comments or approval from the Owner.
     4) Ensure that all areas of the system containing or affected by the same design defect shall have the correction or remediation incorporated.
     5) The correction or remediation Works shall be coordinated with the Owner so as not to adversely affect the airport operations.
  c. The BHS Contractor shall at his own cost redesign a defective component and provide redesigned replacement components.
  a. The design and the part warranty period, not only for the component, but for the entire sub-system, shall restart with the effective date of the acceptance of the last installed correction or remediation.

PART 2 - Products & Components Requirements

2.1 BHS Contractor Qualifications

A. General
- All unlisted conveyor manufacturers can submit their company's qualifications and references as an RFI during the bidding process.

B. BHS Contractor Qualifications
- The BHS Contractor must have completed the design, manufacturing, construction, and certification of at least three (3) PGDS screening systems of similar scope as herein specified within the last five (5) years, within the United States; and who has established a stable organization for service and spare parts.

C. BHS Installer Qualifications

- Equipment shall be installed by qualified workers with factory-trained and certified supervisors.
- Supervisory personnel shall each have at least five (5) years of successful experience with the installation of airport conveyor systems and Claim devices of the type specified herein.

D. BHS Controls Contractor Qualification
- The BHS Controls Contractor must have completed the design, integration, and certification of at least three (3) PGDS screening systems and CBRA projects of similar scope as herein specified within the last five (5) years, within the United States.

2.2 Approved CBIS/BHS Integrators

A. Automatic Systems Inc.
- Erika Jump
- 9230 E. 47th Street.
- Kansas City, MO 64133
- Phone: 913-530-1664
- erika.jump@asi.com

B. Beumer
- 6430 S Fiddlers Green Cir, Suite 250
- Greenwood Village, CO 80111, USA
- Phone: 732-893-2800
- usa@beumergroup.com

C. Daifuku
- 30100 Cabot Drive
- Novi, MI 48377
- Phone: (847) 565-9235
- Fax: (248) 553-1228
- AWuchte@jerviswebb.com

D. Diversified Conveyor International
- 2163 Airways Blvd. Suite 300
- Memphis, TN 38114
- Phone (901)396-5370
- Sales (901)746-3018
- sales@teamdci.com

E. G & S Airport Conveyor
- Tim Buffam
- 3409 West Harry St.
- Wichita, KS 67213
- tim.buffam@gsairportconveyor.com

F. Oshkosh Aerotech
- Tenille Whitten

- 4074 S 1900 W
- Roy, UT 84067
- Phone: (801-388-6970)
- twhitten@oshkoshaerotech.com

G. Robson Handling Technology
- Peter Bjostad
- 129 S. Main St #260
- Grapevine, TX 76051
- Phone: (972) 800-8168
- Peter.bjostad@robson-usa.com

H. Vanderlande
- 1828 West Oak Parkway
- Marietta, GA 30062
- Phone: 770-250-2800
- info@us.vanderlande.com

I. Western Industrial Contractors
- John Eddy
- 25755 E 65th Ave
- Aurora, CO 80019
- Phone: (720-861-4702)
- JEddy@westerncon.com

2.3 Approved BHS Controls Contractors:

A. ControlTouch (Existing OEM)
- An approved equal must be able to integrate with the existing ControlTouch system and must be submitted for approval prior to bidding.

2.4 Approved OEM Equipment Suppliers

A. Conveyor Belt
- Forbo-Siegling
- Ammeraal

B. Power Curves/Turns
- Portec
- FlowTurn

C. Incline Plate Carousels
- Beumer
- Vanderlande
- Siemens
- Mechanica

- Unified Supply

D. High Speed Diverter (HSD)
- Siemens Type 3
- Vanderlande

E. Motors
- SEW/Movimot
- Nord

F. Clutches
- Warner
- SEW
- Dodge

G. Reducers
- SEW
- Nord

H. Brakes (Electric)
- Warner
- SEW
- Dodge

I. Drum Motor (Motorized Pulleys)
- Van der Graff
- Interroll

J. Motor Starters
- Allen-Bradley
- Cutler Hammer
- Siemens
- Schneider Electric

K. Soft Start Devices
- Allen Bradley
- Siemens
- SEW
- Schneider Electric
- Nordic Controls

L. VFD
- Allen-Bradley
- Siemens
- SEW
- Danfoss
- Nord

M. PLC's
- Allen-Bradley
- Mitsubishi
- Siemens
- Schneider
- Omron
- Modicon

N. Photoelectric Sensors and Controls
- Allen-Bradley
- Cutler Hammer
- Siemens
- Omron
- Sick

O. MCP Cabinets/Enclosures
- Rittal
- Hoffman
- SEC

P. Fusible Main Switch/Disconnect
- Allen-Bradley
- GE
- Siemens
- Schneider Electric

Q. Circuit Breakers
- GE
- Siemens
- Schneider Electric
- Westinghouse

R. Motor Switch Disconnect
- Allen-Bradley
- Siemens
- Schneider Electric

S. Signaling Devices (Audible Alarms/Beacons)
- Edwards Co. Signaling Products Div.
- Allen-Bradley
- Siemens

T. Operator Devices (push buttons, E-stops, selector, and key switches)
- Allen-Bradley
- Siemens
- Schneider Electric

U. Relays

- Allen-Bradley
- Siemens
- Schneider Electric

V. Timers
- Allen-Bradley
- Omron

B. Vibration Dampers
- Demag
- Tico

C. Anchor Bolts
- Hilti

W. Draught Curtains
- Trax
- C&M Associates

X. Powered Fire/Security Doors
- Overhead Door, TX
- Atlas Door
- Stoebich

1. Vigneaux
- Raynor
- AESI

Y. Roller Bed Conveyors
- Hytrol

Z. Remote Status Maps (field touch screen workstation)
- Siemens
- Allen-Bradley

2.5 General Components

A. Bearings
- All bearings shall be precision, self-aligning, low friction, pre-lubricated sealed-for-life bearings.
- The total number of different bearing sizes and types should be kept to a minimum to reduce the number of different size spares required.
- All bearings shall have a minimum L10 service life of fifty thousand (50,000) hours, based on the manufacturer's published data, showing the rating of each bearing used against the peak working conditions.
- Bearings shall be mounted in flanged housings. In the event of return rollers, it is also acceptable to have pressed in bearings in the return idle roller.
- Bearing housings shall be securely fixed. Misalignment during operational periods shall not be possible.

- All exposed bearings shall be provided with bearing covers. Snap-on plastic bearing covers are acceptable; however, rigid steel bearing covers are preferred.
- Bearings must be capable of absorbing miss-alignment, machining tolerances and flexing of the shaft. Bearing inner race should be secured to the shaft to prevent concentric and axial movement. Adhesive or welding is not allowed.
- Bearings shall be easily replaced within twenty minutes (20 min). When replacing a bearing the alignment shall be automatically assured.

B. Vibration Dampers
- The equipment installed by the BHS Contractor shall not produce or induce objectionable vibrations into the building structure. Vibration levels induced by the system and/or its components shall not be injurious to the system or the building structure or be harmful or annoying to passengers and/or employees.
- The BHS Contractor shall mount all equipment on vibration isolators to eliminate such vibrations from being transmitted to the building. There must be no vibration noticeable in public and/or office spaces.
- Equipment and components associated with the CBIS/BHS system and that are surface mounted using header steel to building elements and/or mezzanines, shall not transmit any vibration to these structures.
- All equipment, header steel, hangers and other supports shall be installed in accordance and be fully compliant with all local, City & County, State and Federal seismic codes.

2. Nylon locknuts (Nylock) must be used to prevent the loosening of nuts due to vibration and the inherent compression of the pad material when tightened down.

C. Structural Steel
- Structural support shall comply with local State and Federal requirements.

D. Floor Supports
- Unless otherwise specified, steel floor supports shall be used to support CBIS/BHS equipment, which is installed 8’-0” or less above the floor (platform/mezzanine) level.
- All floor supports shall be of the H-type design and shall, if possible, not be wider than the equipment being supported to avoid trip points.
- The floor supports shall be located at the splice point or within 12” of the splice point for intermediate equipment sections. Maximum spacing between supports shall be no more than 10’-0” apart. Supports at head and tail end of conveyors shall be no more than 12” from the center of the end roller.
- Floor supports at conveyors used for loading applications, e.g., arrival and transfer inputs, shall have supports no more than 5’-0” apart.
- The floor supports must allow for a vertical height adjustment in the field of no less than +/- 4”. All floor supports shall be true vertical.
- All floor supports shall be anchored to the floor with a minimum of two (2) anchors per support. No welding of floor supports to conveyor frame or building structures is permissible.
- All floor supports must be fitted with vibration dampers located either at the attachment point to the CBIS/BHS equipment frame or where they attach to the building structure.

E. Sway Bracing & Cross-Bracing
- All equipment shall be provided with sufficient sway bracing to eliminate lateral and longitudinal movement providing a rigid construction.

- Cross-bracing shall be provided between floor supports and hanger supports to ensure rigidity and eliminate lateral movement and vibration of the CBIS/BHS installation.
- Cross-bracing shall not obstruct access routes or pass under CBIS/BHS equipment.

F. Cross-Overs
- Provide vertical steps from the catwalk/walkway/platform/mezzanine to the landing aligned with the top of the sideguard such that personnel with a single step can step over the equipment.
- Provide a single tread with a width of no less than 8” on each side as a landing.
- Provide 42” high handlebars across the CBIS/BHS equipment to assist personnel with the step-over. Such handlebars and its vertical supports shall be made of 1” round tubing or 1”x1” square tubing with a minimum thickness of 3/32”. The use of angled or flat bars is not allowed.
- Toolbox Shelf
  a. On one side of the step-over provide a 12” wide shelf for the total length of the step-over, which can be used by maintenance staff to temporarily place and slide tools across the CBIS/BHS equipment when stepping over the operational equipment.
  b. The shelf shall be able to support a minimum load of 100 lbs.

G. Protective Guarding
- All moving parts shall be protected by guarding to prevent personnel injury.
- All drive units shall be equipped with suitable guards to prevent unintentional entry by personnel into areas with moving parts. These shall be designed for easy removal for maintenance access and fabricated from a minimum #14-gauge painted mild steel.
- All guards shall comply with applicable OSHA standards and shall have expanded metal screen windows to allow for inspection of parts and belts where appropriate without removal of the total guard.
- Paint all such guarding as approved by the Owner.
  a. Shaft Encoder Guards
     1) The guarding for shaft encoders and pulse generators shall allow visual inspection of the encoder or pulse generator.

H. Protective Curbing & Guardrails & Bollards
  a. In areas where CBIS/BHS equipment might be subject to damage from tugs, dollies and/or vehicles, the BHS Contractor shall install the necessary and appropriate guardrails and bollards (impact protection) to minimize or eliminate such damage.
  b. The impact protection shall be able to withstand impact from a tug containing four (4) fully loaded carts/dollies at a speed of 2 mph without damage to the equipment being protected.
  c. Guardrails shall be installed where design in the contract drawings.
- Load/Unload Areas
  a. The top of the guardrail shall be positioned 1/4” higher than the conveyor with a tolerance of +/- 1/8” such that a dolly/cart or other device riding the guardrail does not impact with the conveyor.
  b. At all times, the installation shall minimize the height that personnel have to lift baggage above the TOB in order to clear the guardrails.
  c. Installation methods in these areas shall take into consideration that the floor may not be level relative to the conveyor TOB and guardrails shall be manufactured for

these areas such that the leveling process and height matching to the conveyor TOB can be accomplished with final welding done on-site.

d. The distance between the conveyor and the guardrail shall be minimized to avoid personnel having to reach long distances to collect baggage, resulting in potential hazards and/or injuries.

I. Metal Under-Guarding

- All moving equipment, which is subject to personnel crossing underneath shall be provided with metal under-guarding. Under-guarding shall be provided on equipment less than 7'-6" from personnel access level.
- The maximum size of each under-guarding panel shall be no more than 60" x 40". The minimum thickness shall be #14-gauge painted mild steel.
- Fixed Metal Under-Guarding
  a. Locations with minimal personnel crossing underneath the equipment shall be provided with fixed metal under-guarding.
  b. The under-guarding shall be attached to the equipment with butterfly nuts on both sides.
- Hinged Metal Under-Guarding with Slice Lock
  a. Locations with frequent personnel crossing underneath the equipment such as main maintenance access routes shall be provided with hinged metal under-guarding rather than fixed metal under-guarding.
  b. The under-guarding shall be hinged and attached with quick release safety slide lock pins on both sides.
- The BHS Contractor shall coordinate with the Owner where fixed and hinged under-guarding is provided.

J. Drip Pans

- Provide drip pans underneath all drives and other equipment subjective to oil leaks.
- Drip pans to be painted Safety Yellow.
- Drip pans shall be capable of containing all fluid that might escape from the gearbox due to a seal failure.
- Pans shall cover the entire area that fluid may drip from. The drip pan shall be minimum 8" x 10" and have a minimum thickness of #14-gauge mild painted steel in the same color as the conveyor.
- The BHS Contractor shall provide a drain plug in each drip pan unless each drip pan is equipped with oil soaking pads.

K. Gap Pans/Debris Trays

- Provide gap pans underneath the transition between two (2) adjacent conveyors or where a gap is created between two (2) different types of BHS technology equipment such that the gap pan can collect debris from the operation.
- Gap pans shall cover the entire width of the conveyor/equipment.
- Gap pans shall slide in and out to one side only. The gap pan shall slide out to the side of the equipment where motors and sensors are installed.
- The gap pan shall be minimum 8" wide, 1-1/4" deep and have a minimum thickness of #14-gauge mild painted steel in the same color as the conveyor.
- The gap pan shall be installed at a maximum distance of 4"-6" below the end rollers.
- Drip Pans to be colored Safety Yellow.

L. Control Station Stanchions
- Where required provide stanchions made of round or square steel tubing (stainless steel in lieu of mild steel in public areas) as coordinated with the Owner, to allow convenient installation of control stations.
- The location of stanchions shall not pose any risk of personnel injury or obstruction of baggage flow.
- The stanchions shall be rigid and securely fastened such that flex and movement of the stanchion is eliminated. Provide intermediate support where necessary.

M. Painting
- All structural parts, except those surfaces coated with a galvanized coating, and those that would normally be unpainted (such as rollers, shafts, sprockets, bearings, pulleys, chains, nameplates etc.) shall be painted with two (2) coats of rust inhibiting enamel applied under controlled factory conditions. This includes all supports structure, bed undersides, drive structures, pulley guards, walkways, mezzanines, etc.
- Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

N. Powder Coating
- Alternative to painting the BHS Contractor may provide powder coated components/parts.

O. Equipment Identification
- The only permissible identification marking on any CBIS/BHS equipment is to be the specific equipment identification number for this project in public areas. Any other form of identification or markings on the equipment is not acceptable and must be removed, including, but not limited to, manufacturer’s name, brand, model number etc.
- All CBIS/BHS equipment shall be identified by its own discrete ID number on both sides of the equipment. Individual conveyor segments shall have their own unique ID. Each name plate shall contain a human eligible ID and associated barcode for handheld barcode readers.
- The identification must be in line with current equipment nomenclature and marking, if any. The BHS Contractor shall submit the naming convention as part of the FDS submittal. This shall cover all equipment (mechanical, electrical, control, IT, network, power, E-stop).
- In non-public areas the identification shall be made with permanent paint or in form of stencils and be black in color. Each character shall be nominally 4” in height and be located in a conspicuous location on both sides of the conveyor/equipment (adjacent to the conveyor drive in the case of a conveyor).
- Identification in public areas shall coordinated with and be approved by the Owner in writing.
- Conveyor data identification plates shall be clearly positioned adjacent to the drive, recording as installed / commissioned details of speed, motor type, serial no., belt type and belt length, no load running figures and pulley and belt configuration diagram. Similar data identification plates shall be provided for other equipment as applicable for this technology.
- All CBIS/BHS equipment numbering and MCP numbering shall be consecutive with no missing numbers. In the event of additions or deletions prior to each system completion, renumbering is required to adhere to this requirement. The BHS Contractor shall ensure

that such renumbering is done thoroughly, and it is reflected in the drawings, controls, SCADA, documentation, and manuals.

- The BHS Contractor shall completely remove any temporary markings on new equipment associated with manufacture, shipping, or installation. In the event of temporary markings for the purpose of manufacture, shipping, or installation, assure that such markings are made using a medium, which is easily removable with water or any readily available solvent, so that they may be removed without requiring any refinishing of the surface on which they appeared.
- Wire and Cable Marker
  a. For wire/cables smaller than No. 2/0 use manufacturer's standard vinyl-cloth self-adhesive cable/conductor markers of wrap-around type, either pre-numbered plastic-coated type, or write-on type with clear plastic self-adhesive cover flap are to be used and numbered to show circuit identification.
  b. All markings shall be machine printed. Handwritten markings are not allowed.
  c. All electric wire and cable shall be color coded and shall have the wire numbers as shown on the electrical drawings affixed to both ends of each cable and wire approximately 2” from the termination point to prevent obstruction of the label.
  d. For cables No. 4 AWG and larger heat shrink sleeving is to be used for phase color coding.
- Plasticized Tags
  a. Provide manufacturer's standard preprinted accident prevention and operational tags, on plasticized card stock with matte finish suitable for writing, approximately 3-1/4” x 5-5/8”, with brass grommets and wire fasteners, and with appropriate preprinted wording including large-size primary wording, e.g., DANGER, CAUTION, DO NOT OPERATE in all appropriate locations.
- Baked Enamel Danger Signs
  a. Provide manufacturer's standard "DANGER" signs of baked enamel finish on #20-gauge steel; of standard red, black, and white graphics; 14” x 10” size except where 10” x 7” is the largest size, which can be applied where needed; with recognized standard explanation wording, e.g., XXXX VOLTS, KEEP AWAY, BURIED CABLE, DO NOT TOUCH SWITCH, etc. in all appropriate locations.
- Engraved Plastic-Nameplates
  a. All electrical equipment shall be identified unless stated otherwise.
    1) Nameplate Colors
      a) Nameplates for emergency equipment shall be laminated phenolic white letters on a red background.
      b) Nameplates for all other equipment shall be laminated phenolic black letters on a white background.
  b. Embossed plastic adhesive (Dymo) tape will not be accepted for nameplates.
  c. Nameplates shall be attached using a method that is effective and reliable and name plates do not fall off. The thickness shall be 1/16” for nameplates up to 20 square inches or 8” in length, and 1/8” for larger nameplates.
  d. All junction (J) boxes and pull boxes shall be labeled to identify the circuits of the enclosed conductors.
  e. All control stations shall be labeled with the equipment controlled by the applicable E-stop zoning.

P. Draught Curtains

- Draught curtains shall be provided at all wall and floor penetrations to prevent draughts and unobstructed views of the baggage system beyond. The draught curtain shall completely cover the opening and shall not impede or interfere with normal operations (e.g., false trigger of photo-sensors).
- Draught curtains shall be made from overlapping flame retardant, oil resistant, sound damping, black plastic strips with teardrop edges. Teardrop edges shall be provided to avoid twisting of curtains. In areas with high draft, two (2) curtains behind each other shall be provided to minimize draft.
- Draught curtains shall have fire-retardant properties.
- The draught curtain shall consist of strips in two (2) staggered layers with 4" overlap. Each curtain strip shall be 8" wide by 1/8" thick.
- The strips shall be full length, i.e., shall end only approximately ¼" above top of equipment surface.
- The draught curtain shall be installed by use of a stainless-steel frame in public areas. The SS frame shall be made of 2" wide angled strip, #14-gauge thick, and all sharp edged shall be removed. Use countersunk screws.

Q. AC Motors & Gearboxes/Reducers

- General
  a. The BHS Contractor shall furnish drive packages consisting of hollow shaft slip on C-face radial mounted right angle gear motor with torque arm in lieu of a drive train with individual components.
  b. The BHS Contractor shall furnish drive packages matching existing drive packages. The number of different combinations of motor and gearbox/reducer shall be minimized.
  c. All drives shall have a motor/reducer sized to permit start up under full load conditions as per specified loads and start/stop cycles.
  d. Inspection holes (motor/gearbox coupling for example) shall be positioned at the front for ease of inspection.
  e. Nameplates shall be orientated such that they are easily visible from the side or front. Nameplates that are covered by fixtures (drip pans for example) shall be relocated.
- Motors
  a. Motors shall be mounted in a vertical orientation unless otherwise approved in writing by the Owner (location specific).
  b. All motors shall have a minimum service factor of 1.15.
  c. All motors shall be rated for continuous running duty (type S1) as specified per standard IEC 60034-1, i.e., one hundred percent (100%) duty factor, twenty-four (24) hours a day, seven (7) days a week, three hundred sixty-five (365) days a year.
  d. All motors shall achieve IE3 levels of energy efficiency either through compliance with IEC60034-30 (2008) Efficiency Level IE3, or using an IE2 motor in combination with a variable speed drive (VFD).
  e. All motors shall be NEMA Design "C".
  f. All motors shall be High Starting Torque Continuous
  g. All motors shall be constant speed, continuous service, ball bearing type.
  h. All motors shall be Class "B" insulation (double insulated), totally Enclosed Fan-Cooled (TEFC) and thermal overload protection.

Table 12: NEMA Design Class

NEMA	Max Slip	Start Current	Locked rotor torque
Design C	5%	Low	High

i. Motor size shall be limited between 0.33 HP and 7.5 HP. Provide all motors designed for the following power supply:

Table 13: Motor Power Supply Requirements

Specification	Rating
Voltage level [VAC]	480
Phases	3
Frequency [Hz]	60
Rotational speed (Asynchronous) [rpm]	1740
Rotational speed (Synchronous) [rpm]	1800

j. All motors rated at less than 2 HP shall be high efficiency type (IE2) as per IEC 60034-30, while motors over 2 HP shall be premium efficiency type (IE3) as tested in accordance with IEEE Standard 112B and CSA 390 testing protocol, using accuracy improvement by segregated loss improvement as specified in NEMA Standard MG1-12.53a.

Table 14: IE3 Efficiency Levels in Percent

HP	kW	2 poles 50 Hz / 60 Hz	4 poles 50 Hz / 60 Hz	6 poles 50 Hz / 60 Hz
1	0.75	80.7 / 77.0	82.5 / 85.5	78.9 / 82.5
1.5	1.1	82.7 / 84.0	84.1 / 86.5	81.0 / 87.5
2	1.5	84.2 / 85.5	85.3 / 86.5	82.5 / 88.5
3	2.25	85.9 / 86.5	86.7 / 89.5	84.3 / 89.5
5	3.75	- / 88.5	- / 89.5	- / 89.5
7	5.5	89.2 / 89.5	89.6 / 91.7	88.0 / 91.0

- Gearboxes & Reducers
  a. Gearboxes/reducers shall be mounted in accordance with manufacturers recommendation.
  b. Gearboxes/reducer leaks are not allowed.
  c. All provided gearboxes shall be of a spur gear, bevel gear, helical gear, or hypoid gear type to maximize efficiency of the gearbox. The use of worm gear is not acceptable and shall not be provided.
  d. All reducers shall have a minimum service factor of two (2).
  e. Reducers shall be rated to suit the arduous operating conditions and shall be sized for Class II application as minimum.
  f. Where gearboxes are fitted with a keyway, the key shall span the entire width of the gearbox hollow shaft. Keys shall be adequately contained such that they do not work loose.
  g. Gearboxes shall be sized such that the exterior temperature of the gearbox under normal operations does not pose a hazard to personnel through contact. A maximum temperature of one hundred and twenty (120° F) degrees is allowed.
  h. The reducer shall be shaft mounted with torque arm brackets for easy removal and replacement.
  i. The torque arm fixing shall be securely fixed through a shock absorbing mounting.
- Electrical Brakes
  a. The brake shall be selected according to the motor manufacturer.

b. Brakes shall have a mechanism to allow a manual release of the brake under loss of power conditions. The release shall be easily and readily accessible without special tools, components, and/or disassembly. Once released, the brake must be capable of being re-engaged without the use of special tools, components, and/or assembly/disassembly.

R. Clutches

- Clutches should be avoided where possible. VFD shall be the preference to provide proper control.
- Clutches shall be fitted to equipment where a VFD cannot provide proper control. The clutch shall be capable of handling two (2) times the full torque of the motor.
- The clutch shall be a dry-friction, mechanical disc type. No asbestos material is allowed.
- The clutches shall be capable of a start/stop cycling rate of sixty (60) cycles/minute.
- The clutch shall be fitted between the motor and the input shaft of the right-angle shaft mounted gear reducer.

S. Brakes

- A brake shall be fitted to equipment where a VFD cannot provide proper control and where frequent start/stop cycling and bag tracking are used.
- The brake shall be of the dry friction, spring set and solenoid release type and be integral with the drive motor.
- The brake shall at a minimum have a torque rating equal to the drive motor.
- The brake shall be capable of cycling start/stop at the same rate as the conveyor to which it is applied.
- Brakes shall have a mechanism to allow a manual release of the brake that is easily and readily accessible without special tools, components, and/or disassembly. Once released, the brake must be capable of being re-engaged without the use of special tools, components, and/or assembly/disassembly.
  a. Holding Brakes
     1) A holding brake shall be provided on all incline and decline conveyors with a greater than five (5º) degree slope.

T. Clutch/Brakes

3. Where conveyor function requires a clutch and a brake, a single integrated clutch/brake unit shall be installed. Separate clutch and brake modules shall not be allowed.
4. Drum Motors (Motorized Pulleys)
   a. General
      1) In the event that the application prevents the use of a right-angle motor/reducer for driving of a conveyor, the use of drum motors (motorized pulleys) shall be permitted. The use of drum motors is subject to approval of application and selection by the Owner prior to installation or supply of such. The following minimum requirements apply.
      1) Even if drum motors are approved for use in specific locations by the Owner, the equivalent application requirement shall be met that would apply to a right-angle motor/reducer.
      2) The same performance requirements for right angle shaft mounted motor gearbox/reducer shall apply to drum motors.
      3) Drum motors shall be rated for continuous duty at the maximum design load.
   b. Mechanical

1) The gears enclosed in the drum motor housing must be submersed in an oil bath for lubrication and cooling.
2) The design and mounting of the drum motors must be such that oil level can be checked without loss of oil or the need for the removal of the drum motor from the conveyor frame.
3) All gears shall be hardened steel alloy and comply with the guidelines of the American Gear Manufacturers Association Standards.
4) Drum motors fitted with a brake shall be capable of stopping the conveyor at maximum design load.

c. Electrical
1) The cable connector elbow must be capable of rotating no less than one hundred eighty (180°) to facilitate flexibility regarding power cable inlet location.
2) Power to the drum motor shall be connected directly to the starter without utilizing slip rings or brushes.

2.6 Belt Conveyor Equipment

A. General
- The following requirements are intended as minimum requirements for regular transport belt conveyors within the system.
- Conveyors shall be designed for continuous operations. All moving parts, bearings and wearable parts shall have a proven life of fifty thousand (50,000) hours, based on average loading and proper belt tensioning.
- The conveyor design shall use horizontal flushed transfers between adjacent conveyors. The height difference from the head end (discharge) of the conveyor to the tail end on the receiving conveyor shall be 0” to allow for smooth baggage transition and photo eye detection of “bunched” bags from one conveyor to the next.
- Conveyors shall be capable of handling the maximum load requirements without fault.
- Conveyor sideguards and slider bed shall not damage baggage or belts.
- All metalwork on the conveyor shall have a smooth finish, free of any projecting fasteners, welded metal, or sharp edges.
- All conveyors shall be fitted with a right-angle shaft mounted motor gearbox/reducer capable of a start/stop cycling of twenty (20) cycles/minute under full operational load unless otherwise specified within these Specifications.
- Unless otherwise stated, all belt conveyors shall have the following dimensions.

Table 15: Conveyor Dimensions

Type of Conveyor	Outside Width	Width between Sideguards	Belt Width
Standard conveyor	42”	39”	36”
Power/spiral turn	42”	39”	39”

- The maximum length of any conveyor should not exceed 30’.

5. All conveyors shall be equipped with photo eyes for jam detection.

B. Belts
- General

a. Belting shall be of a robust, flexible, and durable construction with low elongation properties and shall comply with the fire-retardant properties.
b. The Owner is interested in installing the most energy efficient operation possible and should the BHS Contractor elect to use belting other than the types specified below, the BHS Contractor shall provide sufficient information to demonstrate that the selected belting will provide equivalent or better energy efficiency.

- Belting Material
  a. All belts shall have sealed edges.
  b. All belts shall be minimum two (2) ply with a low friction impregnated bottom surface and a top surface as per above application requirements. Minimum top surface thickness shall be 1/16", while the total belt thickness shall be 3 mm. PVC/rubber coated belts should be constructed with two plies of polyester mono filament. One ply of spun fabric should be included on the back of the belt.
  c. The material shall be capable of providing continuous service without showing appreciable wear, cracking, or fraying.
  d. All belts shall have low noise characteristics and shall not mark baggage.
  e. The carrying side of the belts shall be black in color.
  f. The BHS Contractor shall submit his proposed belt selections for approval by the Owner prior to purchasing, supplying, or installing belts on site.
- Belt Surfaces
  a. Belt surfaces shall be selected and suitable for the application as per the following table.

Table 16: Approved Types of Belt Surfaces

Type of Conveyor	Elevation	Belt Type
Level transport belt conveyors	(up to 5°)	Smooth top
Inclined/declined transport belt conveyor	(5° - 18°)	Rough top (RT) or Longitudinal Groove (LG)*
Queuing/metering/merge belt conveyors	Horizontal	Rough top or longitudinal groove
Queuing belt conveyors Pre/Post EDS	Horizontal	Longitudinal groove
45° Merge Belt Conveyor	Horizontal	Vulcanized
Powered power curves/spiral curves	As applicable	Rough top or longitudinal groove
Ticketing take-away conveyor	Horizontal	Smooth top
Receiving conveyor in 90º Butt turn configuration	Horizontal	Smooth top

b. * LG is only recommended for incline/decline belts where low noise is a requirement.

- Belt Joining
  a. The BHS Contractor shall be allowed to use either clipper lacing or alligator lacing for joining belts. The lacing shall be either Clipper "Unibar" or Anchor "Safety Belt Hook" type as per manufacturer's recommendation. Lacing shall not cause damage to conveyor components. In non-public areas the belts shall allow for quick removal and replacement for maintenance purposes.

C. Pulleys/Rollers
- All pulleys are to be statically balanced when operating at speeds in excess of two hundred (200) rpm, and dynamically when operating at speeds in excess of four hundred (400) rpm.

- Shaft diameters for all rollers shall be the same size to minimize gearbox model sizes required for spare parts. The range of pulleys shall be minimized.
- Pulleys shall be easily removable from the conveyor frame. Where it is required to remove conveyor pulleys there should be sufficient room to withdraw the pulley, complete with its shaft, at one side of the conveyor.
- Pulley diameters shall not be smaller than the belt manufacturer's recommendations.
- Pulleys and rollers shall support the belt for its entire width. All pulleys and rollers except for head and tail pulleys shall be at least 1" wider than the belt.
- Pulleys/Shafts
  a. The maximum shaft run out of all assembled pulleys, shafts and bearings under a no-load condition, measured from the centerline of the bearing to the end of the shaft farthest from the conveyor shall not exceed 0.0075" per inch.
  b. Maximum pulley run-out shall not exceed 0.060".
  c. All Pulleys and Shafts shall be designed to CEMA Standard No. B105.1-2009.
- Head & Tail Pulleys
  a. Head and tail pulleys shall not be used as the drive pulley.
  b. All non-powered head and tail pulleys shall be of steel, equipped with compression type hubs and 1-7/16" minimum diameter shafts in accordance with CEMA Standard No. B105.1-2009 mounted in eccentric locking or taper lock type precision and ground flange type ball bearing units.
  c. All head and tail pulleys will be 6" diameter minimum with a #10-gauge wall thickness.
  d. Pulleys shall be of a single piece electric weld steel construction and have steel discs attached to the rim by continuous welding.
  e. Gap between adjacent end pulleys will not exceed 1" with ½" as the design objective.
  f. All head and tail pulleys used for belt tracking shall be equipped with jacking bolts to provide a total combined adjustment of 1-1/2" per conveyor. Jacking bolts are to be equipped with jam nuts to prevent jacking bolts from loosening.
  g. Pulley crowning shall be as recommended by the selected belting manufacturer.
- Drive Pulleys
  a. All drive pulleys shall be equipped with compression type or taper lock hubs with 1-7/16" minimum diameter shafts. Drive pulleys shall be securely fixed to the shaft.
  b. The shaft shall be mounted in eccentric locking, compression or taper lock, precision, and ground flange type ball bearing units.
  c. The type of lagging and pulley crowning shall be as recommended by the selected belting manufacturer. The lagging material shall be compatible with the selected belting to reduce the potential for reversion.
  d. Minimum acceptable belt wrap on drive pulleys shall be nominal two hundred ten (210°) degrees to ensure the belt does not slip-on start-up with a fully loaded belt. The drive pulley shall not damage the belt surface and vice versa.
  e. Drive pulleys shall have a snub pulley to increase the angle of wrap to the required angle. Where the tension roller is behind the drive pulley this shall also be snubbed to maintain a constant angle of wrap.
  f. The drive should not be from the head pulley. Conveyor belts shall be driven on the underside of the belt.
  g. Reversible conveyors shall be driven from a separate drive pulley mounted centrally between the head and tail pulleys.

h. Drive pulleys shall not be less than 6-3/4" in diameter. Drive shaft diameters shall be calculated per CEMA Standard No. B-105.1-2009, based on specified loads, conveyor width and type of shafting material used. These calculations shall be furnished to the Owner on request.

a. Drive pulleys shall not be subjected to belt pulls greater than 50 lbs. per inch of width. Refer to Part 1 § 1.14F for dynamic load requirements.

6. Drum Motor/Motorized Pulleys

a. Drum motor for this project shall be from the same manufacturer and match existing conditions, if applicable.

i. Drum motors shall be rated at minimum class F insulation.

j. Where drum motors are applied for a specific application the performance requirements defined elsewhere in this Specification applies to the drum motor. Example start/stops, service factor, dynamic loads as per 1.14F and lagging.

k. Quick disconnects shall be provided for all drum motors as per Part 2.

- Take-up Pulleys

a. All take-up pulleys shall be a minimum of 4" diameter, steel, and equipped with compression type hubs with 1-7/16" minimum diameter shafts mounted in eccentric locking type precision and ground flange type ball bearing units.

b. Pulleys will be mounted on threaded take-up devices with steel guides with a minimum of 6" adjustment.

- Belt Return Rollers

a. Belt return rollers shall be of precision bearing design, minimum 3" diameter, #11-gauge steel equipped with a sealed, permanently lubricated caged ball, semi-precision type ball bearings.

b. Return rollers shall be located on centers not to exceed 8'-0", with spacing being reduced in areas where belting may drag against the floor or conveyor structure.

c. A return roller shall be provided at the tail end of conveyors to assist with belt tracking.

d. All return rollers shall be equipped with jacking bolts (adjustable retainers) at both sides of the conveyor to facilitate adjustment.

- Snub Rollers

a. Snub rollers shall be a minimum of 3-½" diameter, #11-gauge steel equipped with fixed (welded) 1-7/16" minimum diameter shaft mounted in eccentric locking-type precision and ground flange-type ball bearings.

b. All snub rollers used for belt tracking shall be equipped with jacking bolts (adjustable retainers) at both sides of the conveyor to facilitate adjustment.

c. Quantity and location shall be as recommended by the manufacturer to ensure positive belt tracking.

d. Reversible conveyors shall be provided with snub rollers at both head and tail ends.

- Lagging

a. Drive pulleys for end-type, drum motors or center drives shall be lagged with a minimum of 3/8" thick vulcanized lagging of 50-60 durometer,

D. Slider Bed

- Conveyor slider bed shall be continuous and of sturdy construction and made of minimum #11-gauge steel with a strong and well braced frame consisting of a minimum of 5" x 1-½" x #11 gauge formed channel frame rails with cross braces and a maximum of 3'-4" centers on transport lines and 2'-6" centers on input/load conveyors.

- Cross braces shall be located so as not to contact the belt run under any operational circumstances.
- Slider beds shall be arranged to keep the gap between the end section and the end pulley to a minimum.
- Conveyor bed sections that belting slides over shall remain unpainted for the entire surface area that the belt is likely to contact during normal operations.
- A method for eliminating a sticking effect between belt and slider bed shall be provided. Air holes or other means to accomplish this is subject to Owner review and approval.

E. Sideguard

- General
  a. Sideguards shall consist of formed channel of minimum #14-gauge thick steel with stiffeners (bracing) on a maximum of 3'-4" centers on transport lines and 2'-6" centers on input lines.
  b. Unless otherwise noted, sideguards shall be provided on both sides of the conveyor.
  c. The top rail of all sideguards shall be formed with ¾" double folds to eliminate exposed sharp edges and snag points.
  d. Adjacent conveyors shall be bolted together. Welding is not permitted as an assembly technique.
  e. No conduits or cableways or permanently fixed services shall be installed on removable side guards.
- Heights
  a. The height of sideguards (whether integral to the frame or separate) at manned areas shall following the ergonomic requirements, while the height at all other locations shall follow below requirements.

Table 17: Sideguard Heights

CBIS/BHS Area	Height from TOB
General transport belts, horizontal power curves, queues	12"
Spiral turns with rise or fall of less than 12" per 90-degree turn.	12"
Spiral turns with rise or fall of between 12"-24" per 90-degree turn.	21"
Overhead Conveyors above manned space or drive aisles	21"
Incline/decline conveyors with slope great than 12 degrees	21"
CBIS/BHS Area	Height from TOB

  b. Ensure that the height of adjacent sideguards is properly aligned and within 1/16" maximum height difference.
- Transitions
  a. All sideguards must blend smoothly with adjacent conveyors' sideguards, and in doing so, eliminate the possibility of creating any catch points.
  b. Bolted butt type coupling joints shall be installed between adjacent sideguards. Lapped sideguards are not allowed.
  c. Any openings in sideguards in connection with security screening machines or other equipment in-line shall be flared open in the direction against the flow. Potential snag points created by the flared guard shall be eliminated through the installation of a fill in.
  d. Any openings in sideguards shall be flared open in the horizontal direction for proper operation and to avoid potential snag points.
- Sensor Holes

a. All sensor holes in sideguards shall be press dimpled from the inside and outwards such that catch points are avoided.
b. All sensor holes shall be deburred to avoid burrs and sharp edges. Exposed bare metal shall be properly painted.
c. Unused sensor holes are not allowed and shall be filled with welded steel plate ground smooth and painted.

F. Finger Guard
- At conveyor junctions where a pinch-point is created by two (2) adjacent end pulleys, a finger guard or additional height sideguard shall be provided to minimize the risk of hands or other objects getting caught.
- Head and tail pulleys and relieving idlers shall be short faced and the gap between the ends of the pulley and the side plates made good with a static shroud to the profile of the pulley. The shroud shall be wide enough such that the pulley cannot become exposed under normal operating conditions.

G. Take-up Section
- All belt conveyors must be fitted with a take-up station for belt tensioning and tracking to compensate for belt stretching.
- This can consist of either a separate tensioning station or integrated into the drive station. In either case, the minimum take-up capacity for conveyors of 8’-0” or greater in length must be no less than 18” or one percent (1%) of total belt length, whichever is the largest.
- It shall be possible to adjust the belt tension from only one side of the conveyor using an integrated mechanism that links the tensioning components on both sides of the conveyor such that movement of the tension mechanism on one side of the conveyor automatically adjusts the tension mechanism on the other side of the conveyor by the same amount such that proper tracking of the belt is maintained.
- Belt tension adjustment shall be achievable without removing guards or other conveyor disassembly.
- Reversing conveyors shall have the facilities for tracking the belt in both directions of travel.

H. Weather Protection
- Exterior equipment shall be guarded against outside weather conditions. Provide conveyors exposed to outside conditions with weather protective guarding. Such guarding shall be bolted on, not welded.
- Weather protective guarding in non-public areas shall be made of minimum thickness of #14-gauge mild steel painted in the same color as the conveyor or galvanized steel. In public areas weather guarding shall be manufactured of SS316 material.
- Weather protective guarding shall be provided with stiffeners (bracing) on a maximum of 3’-4” centers. Any edges shall be formed with ¾” double breaks to eliminate exposed sharp edges and snag points.

I. Straight Transport Belt Conveyors
- Mechanical
  a. General transport conveyors shall be capable of handling a minimum of ten (10) stop/start operations per minute continuously under full load.
  b. The conveyor intermediate frame should be formed from mild steel. It can either be formed as a sub-frame into which a slider-bed is fitted and onto which the side-

guards are attached, or as a one-piece design where the frame is formed from one piece comprising both side-guard and frame. A sturdy slider bed shall be fitted within the frame.

c. The frame shall have supports not less than 10' apart. Total deflection should not exceed 1/16" over 10'. The frame should be formed from no less than #11-gauge painted mild steel.
d. Return rollers must be installed for the support of the return belt.
e. Whenever possible, the drive station shall be located at the discharge (head) end of the conveyor.

- Inclines/Declines
  a. Inclined/declined conveyors shall be protected against over-run or run back where this could be critical to the operation.
  b. Provide nose-over sections at the head end of all incline conveyors to ensure smooth transition of bags onto the next down-stream conveyor. A convex vertical curve/bend in a conveyor line shall be accomplished by using a vertical bend section (break-over/nose-over). This section shall be constructed with the same requirements as a standard intermediate conveyor slider bed section. The radius of the vertical bend shall be minimum 10'-0". All nose-over sections shall have an integrated roller to relief the wear on the slider bed.
  c. Where practical incline/decline angles shall be designed based on three, five, twelve, fifteen degrees (3°, 5°, 12°, 15°) and where approved eighteen degrees (18°). Any inclines/declines not confirming to these standards shall be clearly noted on review drawings in table form for approval by the Owner.
  d. A brake shall be provided on all incline and decline conveyors with a greater than five (5°) degree slope.
  e. Holding brakes shall be capable of holding the conveyor stationary under all loading conditions.
- Electrical
  a. Ensure that the design and installation comply fully with the general electrical requirements.
  b. Provide a jam PEC at the head (discharge) end of all conveyors.
  c. Provide a tail end jam PEC at all incline conveyors greater than or equal to fifteen (15°) degrees to detect rolling bags.
- Controls
  a. Provide PLC functions as required to provide a fully functioning and working system in compliance with these Specifications.

J. Power Curve/Turns (Powered Bends)

- General
  a. Power curves/turns shall be of approved manufacturer type and model only.
  b. It is the BHS Contractor's responsibility to make sure that power curves under all circumstances can handle the specified bag dimensions and do not impede/reduce the flow of baggage.
  c. Access to both inner and outer radius is critical for maintenance needs, other hardware shall not be mounted in the vicinity of the inner radius, where the belt has to be drawn off the rollers.
  d. It shall be possible to change the belt in less than twenty minutes (20 min) with the power curve in situ.
- Mechanical

a. The belt supplied and installed shall be the manufacturer's standard belt and have a single splice.
b. Belt speed shall be measured at the centerline of the belt and shall under no circumstance be less than the adjacent belt feeding or takeaway conveyor speed.
c. The maximum angle of a curve shall not exceed ninety degrees (90°). The BHS Contractor shall in his design only utilize power curves of thirty, forty-five, sixty and ninety (30°, 45°, 60° and 90°) degrees. If power curves with other degree values are needed the BHS Contractor shall obtain Owner's approval prior to implementation into the design.
d. For standard size curves/turns the belt surface inside carrying radius shall be no less than 48" with an outside carrying radius of no less than 87" based on a belt carrying surface width of 39".
e. The distance between side-guards (width of conveyor) shall be an exact match to adjacent straight belt conveyors.
f. There shall be no gaps/nip points. Infill pieces shall be provided to eliminate the gaps at the head and tail rollers and between the sideguards and the belt/bedplate.
g. The gap between the head and tail rollers of the power curve and the pulleys of the adjacent conveyors shall be nominally parallel. The mounting of the shafts shall be arranged to reflect this.
h. The outside side-guard shall be easily removable for maintenance access.
i. Sideguards at the drive units shall be removable.

- Electrical
  a. Ensure that the design and installation comply with the general electrical requirements defined above.
  b. No conduits or cableways or permanently fixed services shall be installed on removable side guards.
- Controls
  a. Provide PLC functions as required to provide a fully functioning and working system in compliance with these Specifications.

1.6 Doors

A. Security Shutters/Doors
1. General
a. Security shutter doors shall be provided at all penetrations between public and non-public areas. Security shutter doors shall be upgraded to fire rated security shutter doors when such doors are installed at penetrations of fire rated walls or where the building fire code requires.
b. It shall not be possible for passengers or personnel to manually open any security shutter door with brute force. The BHS Contractor shall provide an electro-mechanical locking bolt solution if the intended security measure cannot be achieved with a clutch/brake motor on the security door.
c. The BHS Contractor shall ensure that the installers of security shutter doors are certified.
2. Mechanical
a. Provide a manual release device (e.g. hand wheel/chain) adjacent to the security shutter door, to allow the door to be manually operated (opened/closed) in the event of an electrical malfunction or power is not present. A fixed mechanical stop shall be provided to prevent door damage.

b. The opening of the security door shall be minimum 55” wide and 36” high above TOB.
c. Install the security shutter door at the non-public side of walls.
d. Provide draught curtain across the width of the wall opening.

3. Electrical
   a. Ensure that the design and installation comply with the general electrical requirements.
   b. The security door shall operate using a 480 VAC, 3 phase, 60-hertz motor provided by the door manufacturer.
4. Controls
   a. Each door should NOT be controlled by its own controller or PLC. Door control, and PE controls should come from PLC in BHS MCP.
   b. Each security door shall only have three (3) PEs controlling it. The PEs monitor door open, door closed, door clear. Integration of PEs into door control box may be required based on OEM.
   c. Provide a control station adjacent to the security shutter door to locally operate the door.
   d. Provide an alarm at SCADA whenever the local control station is in manual operation.
   e. When the security shutter door separates public and non-public areas, the local control panel shall be placed on the non-public side of the door.
   f. It shall be possible via SCADA to identify the status of each security shutter door.
   g. Provide a clear space detection photo eye within 12” of the security shutter door.
   h. Extended blockage of the space under the security shutter door when the conveyor is running shall be detected as a jam.
   i. Provide functionality that allows the security shutter door to close automatically during a power failure.
   j. If the security shutter door comes off the fully open position the conveyor under the door stops immediately.
   k. The conveyor line under the security shutter door shall operate if the door is in manual operation and the door is fully open.
   l. The operation of security shutter doors shall interface with the Automatic Security Authorization System (e.g. card swipe reader at check-in) as this is an integral part of the airport security clearance preventing unauthorized people from starting and stopping systems.
   m. Alarm and fault the security shutter door whenever the following conditions occur. Report each condition individually.
      1) Monitored Door Conditions Shown at SCADA
         a) The motor overload is activated.
         b) The door opened, opening, and failed to open.
         c) The door closed, closing, and failed to close.
         d) The door is in an unexpected condition, e.g. opened when it should be closed. Provide an alarm to report a potential security breach.
         e) The door has been open for an extended period (typically five (5) minutes) and the conveyor under the door is not operating (for any reason).
         f) Door in manual
         g) Bag jam at door

1.7 Carousels

A. General
1. Drives
a. The carousel drives shall be of the caterpillar, high slip friction or chain type design and sized to be capable of starting up and running the carousel at full speed with no abnormal noise under full load conditions despite one (1) drive out of service. This means that each carousel as an absolute minimum shall be fitted with two (2) drives assuming one (1) drive can handle the full load.
b. When a drive becomes non-functioning (due to a mechanical/electrical fault) it shall be possible to operate the carousel when the failed drive has been disconnected. It shall be the maintenance operator's responsibility to ensure that the non-operating drive unit is mechanically disconnected from the carousel.
c. Drives shall be positioned equal-distant from each other and drive speeds (motor efficiency as well as gearbox ratios) shall be balanced such that drives share the load equally.
d. All drives shall be supplied with an electronic soft-start and controlled stop controller or VFD to provide the same function such that shock loading is minimized during start-up and the carousel stops smoothly.
2. Supports
a. All carousels shall be fitted with vibration and/or noise dampening elements made from rubber, neoprene, silicone, or other similar material to minimize noise and transfer of vibration to the building structure. These should be fitted either where the carousel support structure mounts to the building structure, or where the carousel frame attaches to the carousel support structure.
b. The carousel shall be anchored to the floor with approved expansion anchors.
3. Electrical
a. Ensure that the design and installation comply with the general electrical requirements.
b. Carousels provided with in-fill shall be provided with lighting at each drive location and elsewhere as necessary for adequate lighting. The maximum distance between lighting fixtures shall not exceed 15'. It shall be possible to turn on/off all the lights at the same time at each light fixture.
c. A minimum of one (1) 120 VAC duplex power outlet shall be provided in the vicinity of each drive station easily accessible for maintenance purposes.
4. Controls
a. Provide PLC functions as required to provide a fully functioning and working system in compliance with these Specifications.
b. For Claim carousels provide E-stop push buttons with a maximum spacing of 20'. The E-stops shall be installed recessed within the front guard such passengers or baggage trolleys do not accidentally activate the E-stop, however access to the E-stops shall not be restricted.
c. The carousels shall automatically go into energy saving mode when they have operated for a configurable number of revolutions without the presence of bags.
d. Provide visual and audio start-up warnings when the carousel starts or restarts.

B. Incline Plate Carousels
1. General
a. Carousel's final elevation to TOB shall be in compliance with OSHA standards and local airline requirements.

b. Slope-plate carousels shall have heavy-duty articulated pallets/flights forming a continuous rotating sloped surface. They will be fed automatically by conventional baggage belt conveyors from the inside perimeter of the carousel.

2. Dimensions
   a. The minimum usable conveying width shall be no less than 55". The height of the conveying surface at the operator interface relative to fixed floor shall be coordinated with all stakeholders. Expected to be 16" above finished floor.
3. Finish
   a. All steel elements and trim in the make-up area shall be painted in accordance to the Owner's paint Specifications.
   b. All steel elements and trim in the public arrivals area shall be type 304 stainless steel with #4 brush finish. It shall be fastened with concealed fasteners or countersunk, button-head, or oval-head matching screws.
   c. The flights/pallets shall not be painted.
   d. All cladding joints must be true and properly aligned, horizontally and vertically to prevent creating catch points. No protrusions or sharp edges are acceptable. Welds must be ground smooth.
4. Guards
   a. Finger guards must be supplied. The space between the moving bumper and the finger guard shall not exceed 3/32". The alignment of adjacent guards must be flush with no edges to catch baggage. No gaps are allowed between adjacent guards.
   b. Inside guards shall be provided along the entire inside perimeter. They shall be manufactured from no less than #12-gauge formed steel and painted to match all other conveyor parts. The guards shall be 12" high along the inside perimeter and shall be no more than a ¼" above the pallet/flight surface.
5. Transition Plate
   a. The BHS Contractor shall design and provide a loading transition plate at the location of the baggage in-feed belt conveyor. This shall provide a smooth catch-free transition from belt conveyor to the flights/pallets. Special care must be taken to assure that re-circulating baggage does not catch on this plate when passing the in-feed location.
6. Baggage Bumper/Stop
   a. Provide a baggage bumper at each baggage in-feed location to prevent bags from falling off the carousel as they are inducted.
   b. The baggage bumper shall not introduce any sharp edges or snatch points that can damage or catch circulating baggage.
   c. The baggage bumper shall be manufactured of #10-gauge thick stainless steel and be a minimum of 12" high above the guards.
7. Electrical
   a. Ensure that the design and installation comply with the general electrical requirements defined Part 2 § 2.11.
8. Controls
   a. Provide PLC functions as required to provide a fully functioning and working system in compliance with these Specifications.
   b. Provide sensors to detect the presence of bags on the carousel.
   c. Provide sensors to detect the single and double layered bags on the carousel.
   d. The feed of bags onto the slope plate carousel shall be controlled such that gaps between bags already on the carousel are used to induct new bags. It shall be possible to induct bags to gaps that are 40" long.

e. The control shall allow bags to be inducted onto slope plate carousels in two (2) layers. Once the complete carousel is full of bags (two (2) layers) the induction of further bags shall automatically stop until bags have been removed from the carousel. The control shall automatically restart the induction of bags when there is space on the carousel. It shall be possible via SCADA to configure the controls to operate with either one (1) or two (2) layers of bags before it is considered full.

f. The following alarms shall be raised on SCADA associated with the load status of the carousel:
   1) Carousel Load Alarms
      a) 75% full: raise for information only alarm.
      b) 95% full: raise alarm (requires acknowledging)
      c) 100% full: raise alarm (requires acknowledging)

2.7 Control Stations

C. General
   1. The following tables detail the standard control station layouts and functionality.
   2. Typical control stations utilize many different devices. Both colors and capabilities are critical to ensure that control stations operate safely and efficiently.

Table 18: CS Device Acronyms

IMPB	Illuminated Momentary Push Button
SMPB	Solid Momentary Push Button
ILPB	Illuminated Latched Push Button (E-stop)
2LKS	2-position Latched Key Switch
2LSS	2-position Latched Selector Switch
2MKS	2-position Momentary Key Switch
2MSS	2-position Momentary Selector Switch
3LKS	3-position Latched Key Switch
3LSS	3-position Latched Selector Switch
3MKS	3-position Momentary Key Switch
3MSS	3-position Momentary Selector Switch
SL	Stack Light

Table 19: CS TYPE 1 – Transport Conveyor Control Station

Designator	Color	Interface	Status & Position	Function
START/RESET	Green	IMPB	Lamp off	Sub-system stopped
			Lamp blinking (1Hz)	Staff ID card approved. Sub-system ready enabled to start
			Lamp on	Sub-system running
			Pressed	Start-up sub-system
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.
JAM RESET	Amber	IMPB	Lamp off	No fault condition

Designator	Color	Interface	Status & Position	Function
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
			Pressed	Resets the fault condition. System ready to start.

Table 20: CS TYPE 5 – CBRA Bag Feed Line Control Station

Designator	Color	Interface	Status & Position	Function
START/RESET	Green	IMPB	Lamp off	Sub-system stopped
			Lamp blinking (1Hz)	Staff ID card approved. Sub-system ready enabled to start
			Lamp on	Sub-system running
			Pressed	Start-up sub-system
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.
JAM RESET	Amber	IMPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
			Pressed	Resets the fault condition. System ready to start.
INDEX/ AUTO	SS	2LKS	INDEX	Conveyor operated in Index Mode. When a moving bag is detected by a photoeye, all stopped downstream bags will move forward 10”.
			AUTO	Conveyor will operate in the normal, automatic behavior as decided by the PLC.
ALARM SILENCE	Black	FPB	Pressed	Silences the audio alarm. Audio alarm starts again if another fault occurs.
START-UP ALARM	Black	Buzzer	On	Sounder for audible start-up warning.

Table 21: CS TYPE 7 – CBRA Clear Line Control Station

Designator	Color	Interface	Status & Position	Function
START	Green	IMPB	Lamp off	Sub-system stopped
			Lamp blinking (1Hz)	Staff ID card approved. Sub-system ready enabled to start

Designator	Color	Interface	Status & Position	Function
			Lamp on	Sub-system running
			Pressed	Start-up sub-system
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.
JAM RESET	Amber	IMPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
			Pressed	Resets the fault condition. System ready to start.
INDEX/ AUTO	SS	2LKS	INDEX	Conveyor operated in Index Mode. When a moving bag is detected by a photoeye, all stopped downstream bags will move forward 10”.
			AUTO	Conveyor will operate in the normal, automatic behavior as decided by the PLC.
SHUT DOWN	Red	FPB	Pressed	Logs out the operator from the specific take-away conveyor controlled by this control station and the green light in the START pushbutton shall extinguish. If no other take-away conveyors are active all take-away conveyors shall stop immediately, and the security doors shall close upon run empty. If other up-stream take-away conveyors are active all operating conveyors shall continue running. If only down-stream take-away conveyors are running this take-away conveyor shall shut-down.
START-UP ALARM	Black	Buzzer	On	Sounder for audible start-up warning.

Table 22: CS TYPE 10 - Security Door Control Station

Designator	Color	Interface	Status & Position	Function
AUTO / MAINT	Black	2LKS or 2LSS	Auto	When the selector-switch is in AUTO the fire/security door operates in automatic
			Maint	When the selector-switch is in MAINT the fire/security door operates in local maintenance mode.
DOOR OPEN	Black	FPB	Pressed	When pressed the fire/security door will open.

Designator	Color	Interface	Status & Position	Function
DOOR CLOSE	Black	FPB	Pressed	When pressed the fire/security door will close.
JAM RESET	Amber	IMPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
			Pressed	Resets the fault condition.
START	Green	FPB	Pressed	Start-up sub-system
OVERHEIGHT RESET	White	IMPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Oversize condition no longer present. Reset of fault can be performed.
			Lamp on	Oversize condition detected. Sensor is still occupied.
			Pressed	Resets the fault condition.
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.

Table 23: CS TYPE 12 - Motor Control Panel (MCP) Control Station

Designator	Color	Interface	Status & Position	Function
START	Green	IMPB	Lamp off	Sub-systems connected to CDP is stopped
			Lamp blinking (1Hz)	Sub-systems connected to CDP is starting
			Lamp on	Sub-systems connected to CDP is running
			Pressed	Start-up sub-systems connected to CDP. Resets any fault conditions and restarts equipment
STOP	Red	IMPB	Lamp off	Sub-systems connected to CDP is running
			Lamp blinking (1Hz)	Sub-systems connected to CDP is stopping
			Lamp on	Sub-systems connected to CDP is stopped
			Pressed	Stop sub-systems connected to CDP
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.

Designator	Color	Interface	Status & Position	Function
E-STOP RESET	Red	IMPB	Lamp off	No E-Stop condition. Panel on.
			Lamp blinking (1Hz)	E-Stop condition released. Reset can be performed.
			Lamp on	E-Stop activated.
			Pressed	Resets E-Stop condition. Panel ready for restart.
LAMP TEST	Black	SMPB	Pressed	All lamps on the panel and subsequent panels light up. All lamps, beacons and pilot lights connected and fed by the CDP panel lights up.
ALARM SILENCE	Yellow	SMPB	Pressed	Silences the audio alarm. Audio alarm starts again if another fault occurs.
FAULT RESET	Black	SMPB	Pressed	Resets the fault condition. System ready to start.
PHASE L1	White	ILLT	Lamp off	Phase is off (power outage)
			Lamp on	480 VAC phase is available
PHASE L2	White	ILLT	Lamp off	Phase is off (power outage)
			Lamp on	480 VAC phase is available
PHASE L3	White	ILLT	Lamp off	Phase is off (power outage)
			Lamp on	480 VAC phase is available
JAM	Amber	ILLT	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
TECH FAULT	Blue	ILLT	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
SECURITY ACCESS CONTROL FAULT	Magenta	ILLT	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
ENERGY SAVE	White	ILLT	Lamp off	System is running
			Lamp blinking (1Hz)	System is initiating energy saving mode.
			Lamp on	System is in energy save mode
ISOLATOR	Black	2LIS	ON	Panel is ON
			OFF	Panel is OFF
HMI SCREEN	-	Touch screen	Status	The local visualization screen shall show the status of the equipment controlled by the PLC using same screen as SCADA.
POWER METER	-	Digital display	Data	Digital display with power data such as voltage, current, power factor, and power consumption

Table 24: CS TYPE 13 – Over Height Control Station

Designator	Color	Interface	Status & Position	Function
START / RESET	Green	FPB	Pressed	Start-up sub-system
JAM RESET	Amber	IMPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.
			Lamp on	Fault condition. Sensor is still occupied.
			Pressed	Resets the fault condition and equipment restarts after the start-up audio warning
OVERHEIGHT RESET	White	ILPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Oversize condition no longer present. Reset of fault can be performed.
			Lamp on	Oversize condition detected. Sensor is still occupied.
			Pressed	Resets the fault condition and equipment restarts after the start-up audio warning
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.
NORMAL / OFF / REVERSE	Black	3LSS	Auto	All conveyors in the zone are automatically controlled by the PLC
			Off	Isolates all conveyors in the zone (disable)
			Reverse	All conveyors in Overheight zone are run in reverse.

Table 25: CS TYPE 14 – Make-Up User Interface Control Station

Designator	Color	Interface	Status & Position	Function
START	Green	IMPB	Lamp off	Sub-system stopped
			Lamp blinking (1Hz)	Staff ID card approved. Sub-system ready enabled to start
			Lamp on	Sub-system running
			Pressed	Start-up sub-system
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.
JAM RESET	Amber	IMPB	Lamp off	No fault condition
			Lamp blinking (1Hz)	Fault condition and sensor is no longer occupied. Reset of fault can be performed.

Designator	Color	Interface	Status & Position	Function
			Lamp on	Fault condition. Sensor is still occupied.
			Pressed	Resets the fault condition. System ready to start.
SHUT DOWN	Red	FPB	Pressed	Initiate system shutdown. Purge all bags. Stop all conveyors. Stop all security doors. Stop make-up unit.
START-UP ALARM	Black	Buzzer	On	Sounder for audible start-up warning.

Table 26: CS TYPE 15 – Make-Up E-Stop/Reset Control Station

Designator	Color	Interface	Status & Position	Function
START	Green	IMPB	Lamp off	Sub-system stopped
			Lamp blinking (1Hz)	Staff ID card approved. Sub-system ready enabled to start
			Lamp on	Sub-system running
			Pressed	Start-up sub-system
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.

Table 27: CS TYPE 16 – Make-Up Motor Control Station

Designator	Color	Interface	Status & Position	Function
E-STOP	Red	ILPB	Lamp off	No E-stop condition
			Lamp blinking (1Hz)	E-stop condition released. Reset can be performed.
			Lamp on	E-stop condition. Mushroom head pushbutton is still activated.
			Pressed	Activates the E-stop. Equipment stops.
TECH FAULT RESET	Black	IMPB	Lamp off	No Tech Fault conditions present
			Lamp blinking (1Hz)	Tech Fault condition is present
			Lamp on	Ready for reset. All faults cleared
			Pressed	Resets fault condition once cleared.
JOG	Black	FPB	Pressed	The carousel jogs forward for as long as the button is pressed, and maintenance mode is active
AUTO/OFF/MAINT	Black	3LKS	Auto	Carousel will operate in the normal, automatic behavior as decided by the PLC.
			Off	Make-up unit is off and cannot be started. Neither the PLC or JOG buttons can move the make-up unit.

Designator	Color	Interface	Status & Position	Function
			Maint	Make-up unit will not be controlled by the PLC but instead can be manually jogged using the JOG buttons.

Table 28: CS TYPE 20 – Cross Over Control Station

Designator	Color	Interface	Status & Position	Function
STOP/START	Blue	IMPB	Lamp off	Control station is not affecting associated conveyor. Conveyor will run as intended.
			Lamp on	Associated conveyor has been temporarily stopped. Press either button again to reset the stoppage.
			Pressed	Turn on and turn off cross over functionality

Table 29: CS TYPE 24 – Manual Intervention Control Station

Designator	Color	Interface	Status & Position	Function
MANUAL / OFF / AUTO	SS	3LKS	Manual	The associated conveyor runs continuously, bypassing the PLC.
			Off	The associated conveyor is disabled.
			Auto	The associated conveyor is automatically controlled by the PLC.
MANUAL / OFF / AUTO	SS	3LKS	Manual	The associated conveyor runs continuously, bypassing the PLC.
			Off	The associated conveyor is disabled.
			Auto	The associated conveyor is automatically controlled by the PLC.

Table 30: CS TYPE 29 - Oversize Pickup

Designator	Color	Interface	Status & Position	Function
BAG READY FOR PICKUP	Green	FPB	Pressed	Illuminates blue Bag Ready for Pickup light
BAG REMOVED	Black	FPB	Pressed	Turns off blue Bag Ready for Pickup light

Table 31: CS Type 30 - Oversize Pickup Indicator

Designator	Color	Interface	Status & Position	Function

BAG READY FOR PICKUP	Blue	SL	Lamp off	There are no bags ready for pickup at OS drop-off area.
			Lamp on	Oversize bag is ready for pickup at designed OS drop-off area

2.8 Emergency Stop (E-Stop)

A. General
- The BHS Contractor shall provide a failsafe emergency stop configuration in compliance with NFPA 79 that allows personnel to immediately stop the equipment in case of personnel injury or equipment damage. Any requirements listed below that conflicts with NFPA 79 shall be ignored.

3. On activation of a safety device all equipment with an associated risk shall be brought to a stop.
4. Emergency stopping devices shall be used to improve protection along baggage system equipment and any other potentially hazardous location.

- Visible red indication lamps shall be provided for each emergency stop device to indicate that the device has been activated.

B. E-Stop Zoning
- Conveyors shall be configured into Emergency stop zones that consider safety of personnel and equipment, while also consider continued operation to the extent possible. The BHS Contractor shall submit E-Stop Zoning Layout and E-Stop Location Layout for review and approval.
- Emergency stop zones shall be in line of sight.
- Hold Baggage Screening lines shall have separate emergency stop zones such that activation of an emergency stop on a screening line shall not affect the operation of other screening lines.
- Two (2) parallel lines of equipment, i.e., separate sub-systems, shall be configured in separate emergency stop zones to minimize disruption to operations.
- Two (2) stacked lines of equipment, i.e., separate double-stacked sub-systems, shall be configured in separate emergency stop zones to minimize disruption to operations.

C. Inter-Locking
- Emergency stop zones shall overlap at wall or slab/floor penetrations.
- Emergency stop zones shall overlap as necessary at the junction of conveyor lines.
- Two (2) adjacent emergency zones shall both be activated when E-stops in the immediate vicinity of the zoning border is activated.

D. Response Times
- Activation of E-stop device shall stop the equipment immediately under controlled and powered conditions. Once the equipment has stopped, the power supply shall be disconnected.
- Activation of an emergency stop device shall enable the ‘Start’ push button on the control station in conformance with ASME requirements. The Emergency stop circuit shall only be able to be reset using the ‘start’ push button from the enabled control station, after the emergency stop device has been released. MCP Emergency Stop resets push buttons shall be programmed as a central reset in the event of a fault that disables the latched Emergency stop from being reset.

2.9 Electrical & Power Requirements

A. General

5. The BHS Contractor shall provide components, parts, and equipment to match existing installation(s) and spare-parts inventory. In the event that parts and equipment have been superseded or replaced with newer models, the BHS Contractor shall detail this replacement/substitution and make sure that such replacements are compatible with all existing controls and systems. In the event that any existing cables, parts and equipment on-site need to be replaced in order for the BHS Contractor to fulfil the requirements of this Contract the cost of such replacement shall be covered by the BHS Contractor.

- All equipment shall meet current industrial standards and must belong to tried and tested product families to ensure continuity and shall be widely available.
- All equipment shall be suitable for use under harsh environmental conditions (e.g. temperature, soiling, electrically contaminated environs, vibrations/shocks, humidity, altitude climate).
- All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE, Underwriters Laboratories Inc., and Electrical Standards.
- All equipment shall be supplied and installed in accordance with the manufacturer's recommendations.
- Electrical connectors and terminals shall mate and match, including sizes and ratings, with equipment terminals that are recommended by equipment manufacturer for intended applications.
- Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, stress cones, splice kits, termination kits, wire nuts and cable ties as recommended for use by accessories manufacturers for type of services as required.
- Comply with the requirements of the reference standards noted herein, except where more stringent requirements are listed herein or otherwise required by the Contract Documents.
- Prohibited Materials
  a. Intermediate conduits
  b. Aluminum conduit and Aluminum, Zinc Die Cast boxes and fittings
  c. Set screw type fittings 2" and smaller.
  d. Wire channel and associated products.
  e. Power poles.
  f. Nonmetallic flexible conduit.
  g. Armored cable of any type.
  a. Modular wiring systems.

B. Electrical Components

- Power Cables
  a. Power cables and wires shall be industrial grade, oil resistant, low smoke and fume, non-toxic halogen free cables isolate rated for 600 VAC.
  b. All conductors shall be copper.

C. Electrical (Power) Components

- Junction Boxes
  a. Junction boxes for control wires shall be 12" x 12" x 8" in size and provided with terminal boards.
- Wire-ways/Cable Trays
  a. Wire-ways and cable trays shall be galvanized trays.

b. Wire-ways and cable trays shall be continuously grounded between sections.
c. Separation of power and control cables within the wire-ways and cable trays shall be done with a metal divider.

- Conduit
  a. It is acceptable to run multiple cables/wires in the same conduit provided such installation can be performed without damaging the cables.
  b. Under no circumstances shall low level control cables or LAN communication cables be installed in the same conduit as power cables.

6. Motor Starter
   c. Motor starters shall be suitable for forty (40) operating cycles per hour minimum, NEMA rated, 3-phase, 400 VAC, 24 VDC starter coil voltage, magnetic across-the-line contactors, each with a holding contact and auxiliary contacts as required.
   d. Motor starters shall each have three (3) manual reset, thermal overload relays.
   e. Reversing motor starters shall have electrical and mechanical interlocks.
   f. Starters shall incorporate thermal overload protection.
   a. Overload shall be set at one hundred percent (100%).

- Variable Frequency Drives (VFD)
  a. The types and models of VFDs used shall be standardized. All VFDs shall be provided with networking capabilities (e.g., ProfiBus/ProfiNet).
  b. When distributed I/O design is used all VFD motor starters shall be mounted directly on the motor or immediately adjacent to the drive, while the VFD shall be mounted in the MCP when a hardwired design is used.
  c. VFDs shall be supplied as part of the motor starter unit. The rectifier inverter unit shall be of the voltage source type with frequency adjustment and voltage control by pulse width modulation. It shall be possible to adjust the controls on the VFD to give 400-Volts at the full speed output of fifty Hertz (50 Hz).
  d. VFD's shall have dynamic braking capabilities.
     1) Configurable Parameters
        a) Start-up time (0.5-60 seconds)
        b) Start-up voltage
        c) Max current
        d) Stop voltage
        e) Shut-down time
        f) Frequency such that speed can be controlled

D. Motor Control Panels (MCP)

- Open type starters and circuit breakers shall be installed in the interior for each motor.
- Each starter and each control device shall be provided with a machine-typed nameplate for maintenance purposes. Hand-written nameplates are not acceptable.
- A main fused disconnect switch or circuit breaker shall be provided and installed inside the MCP interlocked with the doors such that doors can only be opened with the disconnect in the OFF position. There shall be an inter-lock override feature that allows trained maintenance personnel to open the door with the disconnect in the "ON" position for maintenance and/or trouble shooting purposes.
- Exposed voltages greater than and including 120 VAC shall be covered/shrouded with a clear plastic material (acrylic or similar), such that personnel are protected from inadvertent contact. Such covers shall be easily removable for maintenance purposes (replacement, repair, cleaning, etc.).

- Provide warning labels inside and outside of the MCP to alert personnel of potential hazards.
- All hot power wires within an MCP that are not isolated when the main disconnect is in the OFF position shall be 'yellow'.
- Resettable devices (fuses, circuit breakers, etc.) shall NOT be located in the lower 12" of the MCP.
- Control fuses shall be monitored in such a manner that O&M personnel can easily identify a blown fuse either by:
- Fuse Monitoring
  a. PLC monitoring and alarming on the SCADA system.
  b. OR installation of equipment integral into the fuse carrier such that a voltage differential across the fuse is detected and a light is illuminated whenever the fuse is blown/removed.
- Controls design shall ensure that load is connected during normal operations such that a blown fuse is immediately evident upon inspection (e.g., powering relays on a circuit that are only active during maintenance operations so that no voltage differential exists across a blown fuse during normal operations and fails to identify a blown fuse would be regarded as a defective design).
- Each MCP shall be provided with the following labels as a minimum.
  a. Designation.
  b. Power requirements, voltage, and capacity.
  c. Power feed location (power source).
  d. Equipment and electrical safety warnings.

7. Where any power within the MCP is not isolated by the MCP main disconnect, provide a label clearly identifying the color of the wires, the voltage and indication that the power is not isolated when the main disconnect is turned off.

8. Additionally, to the front mounted controls and indicators each MCP shall be provided with a layered status light/beacon mounted above the MCP as defined below. The order of the layered colors shall be consistent between all MCP.

Table 32: CDP (MCP) Layered Status Light/Beacon

Designator	Color	Interface	Status & Position	Function
START	Green	Light	Lamp off	System stopped.
			Lamp on	System on and healthy.
E-STOP	Red	Light	Lamp off	No E-stop condition.
			Lamp on	E-stop condition.
JAM	Amber	Light	Lamp off	No jam condition.
			Lamp on	Jam condition.
TECH FAULT	Blue	Light	Lamp off	No technical faults.
			Lamp on	Technical fault condition.

- Internally within the MCP provide a duplex 120 VAC general purpose power outlet.
- Internally within the MCP provide lighting that shall be activated whenever the MCP door is opened.
- The duplex 120 VAC power outlet and the internal panel lighting shall be fused separately from any external general power outlets so that a power circuit overload does not disconnect power to the lighting and general-purpose circuit.

- Within the door of each MCP, in an appropriate binder, provide 11x17" size laminated electrical schematics for the particular MCP along with a laminated list of the equipment controlled by the MCP.
    1) MCP Binder Information
        a) Motor sizes (HP)
        b) Drive type (queue, power turn, merge, door, etc.)
        c) Device function (queuing, indexing, tracking, etc.)
        d) Fuse protection type and size
        e) Starter type (DOL, VFD, soft start)
        f) Electrical schematics

2.10 Low Level Control (LLC) Requirements

A. General
9. LLC power shall be 24 VDC.

B. Control Cables
- Control cables shall be industrial grade, oil resistant, low smoke and fume, non-toxic halogen free cables isolate rated for 300 VDC.
- Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600-volt insulation, rated 60°C, individual conductors twisted together, shielded, and covered with a PVC jacket.
- All power, control, data, communication and signal wire or cable shall be installed in an approved raceway.
- Control cable for field devices such as PEC, shaft encoders, proximity switches and the like shall be installed with adequate cable length such that maintenance staff can disconnect the plug and cable from the field device when replacement or adjustment is required. However, the excess cable length shall not exceed 1'.

C. Control Components
    a. The BHS Contractor shall use the same rating for all control devices per local code.
    b. The BHS Contractor shall minimize the number of control device types used and all types shall be of the same make/supplier.
    c. The BHS Contractor shall ensure that functionality and color of control devices match existing conditions, where applicable.
- Shaft Encoders
    a. Shaft encoders shall be sealed precision plug-in industrial grade encoders rated for continuous use.
    b. Shaft encoders shall be provided for all tracked conveyors. Shaft encoders shall be installed on the shaft of the non-driven head or tail end pulley. The pulse rate of the encoder shall support the required bag tracking accuracy.

10. Photo eyes (PEC)
    a. All photo eyes shall be of the polarized retro-reflective type such that a failed/false trigger from materials common to airport baggage does not result in improper and/or unsafe operation of the system.
    b. Photo eyes shall be of the quick disconnect plug-in type and mounted in a manner such that replacement can be made without rewiring the device and replacement can be completed in less than five (5) minutes.

c. Photo eye brackets shall be designed in such a manner that the photo eye can be manipulated in all axes (x, y & z) to ensure proper alignment with the reflector.
d. Photo eyes shall be securely bolted to the equipment on the accessible side of the equipment. The use of magnets or similar non-permanent installation methods are not permitted.
e. Vibration transmitted to photoeyes shall be minimized.
c. Reflector mirrors shall be minimum 2" in diameter and be permanently installed on the non-accessible side of the equipment. Reflector mounting bolts/screws shall be at the perimeter of the reflector to avoid obstructing the reflective function of the reflector.
f. Photo eyes shall be provided at a height above TOB such that the smallest size bag can be detected for proper conveyor operation, fault detection and tracking of baggage. The optimum height of photoeyes shall be 2" above TOB.
g. The photo eye and reflector shall be installed such that there are no more than two (2) penetrations in sideguards, one (1) for the photo eye and one (1) for the reflector. Each penetration shall be 1-1/2" in diameter.
h. Photo eyes shall have a status LED that shows maintenance personnel in the field the status of the photo eye, e.g. powered, aligned, unbroken and broken signal. The LED shall be visible when personnel are standing upright next to the conveyor.
i. The signal strength of the photo eye shall be sufficient and appropriate for the application and installation.
j. Tracking photo eyes shall be provided as necessary to properly track bags and reliable tracking shall be maintained at all times.

- Timers
  a. All timing relays shall be solid state, electronic type timer, 24 VDC with a contact rating of 600 VAC, 6 A.
  b. Relays shall have a variable time range with options of remote switch, instant and timed contacts, and time-on or time-off selection.
- Relays
  k. All control relays shall have a 24 VDC coil rating and a minimum of 8 NO/NC contacts rated at 600 VAC, 10 A.
- Audible Horns (Sounders)
  a. Audible horns/sounders shall be 24 VDC type, which has a sound pressure level of 103 dB(A) at 10' from the horn.
  b. The horn may be an integrated part of a light beacon or a separate unit.
  c. Audible horns shall be oil resistant and of an industrial type.
- Audible Buzzer (Sounders)
  a. Audible buzzers shall be 24 VDC and provide a sound pressure that allows personnel to hear it 10' meters away from the buzzer during normal operation.
  b. Buzzers shall be an integrated part of control stations and operator panels.
- Operational Push Buttons
  a. Pushbuttons shall be flush mounted.
  b. Pushbuttons shall be oil resistant, momentary contact type.
- Safety System / E-stop Push Buttons
  a. All safety pushbuttons used for E-stops shall be red illuminated, maintained contact, push-to-stop mushroom-head pushbutton type. The E-stop pushbutton shall remain illuminated until the E-Stop condition is reset.
  b. E-stop push buttons shall be wired in each zone in series with the power source controlling the conveyors in the subsystem.

c. E-stop conditions shall be depicted at the SCADA and associated MCP.

- Motor Safety Disconnect
  a. Motor safety disconnect switches shall be 3-pole, heavy-duty, non-fusible with a quick-make and break mechanism.
  b. Motor safety disconnects shall include an integrated means of padlocking the disconnect switch in the OFF position.
- Connections
  a. All electrical connections shall be secure and resilient to vibration.
  b. Strain relief support shall be provided for any electrical connection, which is subject to damage or physical force.

D. Control Stations (Operator Panels)

- The control stations defined herein for the different equipment components or sub-systems shall, as a minimum, be provided. However, should additional control stations be required to provide a fully functional system such control stations shall be provided by the BHS Contractor at no cost to the Owner.
- Control Device Abbreviations
  a. The following abbreviations are used in defining the required control devices at each control station.

Table 33: Control Device Abbreviations

Abbreviation	Type of Control Device
ILLT	Illuminated lamp/light
IMPB	Illuminated Momentary Push Button
SMPB	Solid Momentary Push Button
ILPB	Illuminated Latched Push Button (E-stop)
SLPB	Solid Latched Push Button (E-stop)
2LIS	2-position Latched Isolator Switch (Disconnector)
2LKS	2-position Latched Key Switch
2LSS	2-position Latched Selector Switch
2MKS	2-position Momentary Key Switch
2MSS	2-position Momentary Selector Switch
3LKS	3-position Latched Key Switch
3LSS	3-position Latched Selector Switch
3MKS	3-position Momentary Key Switch
3MSS	3-position Momentary Selector Switch

- Color of Control Devices
  a. All control stations and power panels requiring control devices shall use the following devices and colors throughout the installation unless otherwise specified elsewhere in the Contract Documents.
  b. For color coding of CS buttons, refer to TYPICAL DETAILS – CONTROLS STATIONS in the Contract Drawings.
- Overview of Control stations
  a. For an overview of CS layouts, refer to TYPICAL DETAILS – CONTROLS STATIONS & Controls series in the Contract Drawings.
  l. The following table summarizes the minimum types of control stations required and their respective ID. The subsequent sections describe the required devices and control functions.
  b. Operator stations and control stations that match existing conditions to secure a uniform operation of the system shall be provided.
  c. All control stations shall be of the same manufacturer and type.

d. Control stations shall be located so as to avoid impeding access for maintenance.
e. Control stations shall not be installed on conveyor guards, safety guards, or other equipment that is removable.
f. Guarding shall be provided as necessary to protect control stations from damage during normal operation.
g. Each control station shall be provided with labels for all operators and devices and have the following additional labels.
    1) Minimum Labeling of Control stations
        a) Label with the unique control station identifier.
        b) Label listing related equipment controlled and E-stop zone.
        c) Label for each device (lamp, push button, switch)

E. Field Warning Devices (Stacked Lights, Light Beacons & Audible Horns)

- Audible and visual warning devices shall be located at intervals along the conveyor such that they alert personnel in the area of the status of the equipment, e.g. faults, equipment startup conditions, jam conditions, equipment full conditions, E-stop conditions and so on as coordinated with the Owner.
- An audible and visual warning device shall be positioned in the immediate vicinity of potential jam points. Where multiple potential jam points are located within close proximity of one another, one warning device centrally located shall be sufficient.
- Warning devices shall operate independently of each other based on the status of the sub-system or equipment which they represent.
- An audible and visual warning device shall operate in the immediate area of a conveyor fault.
- Light beacons shall continue to operate until the fault condition has been cleared.
- The audible device shall operate for 10 seconds in every 30 seconds or until an operator activates an alarm silence pushbutton in the immediate area in which case the audible alarm shall be silenced. A new fault in the area shall reactivate the audible alarm.
- A visual warning device shall operate continuously whenever an emergency stop device in the area is activated.

F. General Control Requirements

- A complete CBIS/BHS control system shall be supplied as part of the Works required under this Contract.
- The up- and download properties of the decentralized software shall be standard.

G. PLC Hardware

- Each PLC shall consist of a CPU, power supply unit, communication module, interface module and I/O module.
- The PLC modules shall plug and lock into the PLC chassis.
- Each PLC and I/O module shall be a self-contained unit housed within an enclosure.
- All PLCs shall be of the same manufacturer, model, and capacity across the entire design, such that PLCs are fully interchangeable in all sub-systems. The exception being where extended memory is removable. Deviation from this requirement shall only be accepted, if approved in writing by the Owner.
- All PLCs shall be provided with a non-volatile backed up memory (Flash RAM, EEPROM, etc.), that can be configured to download the backed-up program into the PLC active RAM under certain fault conditions.

- Non-volatile memory must be removable, such that the PLC processor can be replaced, the backed up non-volatile memory module inserted into the replacement processor and the PLC program/configuration downloaded into the replacement PLC active RAM when powered up. The sub-system shall restart without any additional operator action or intervention.
- It is preferred to have the PLC installed in the MCP.
- Where PLCs are installed remotely to the MCP (e.g., at the Control room) and fed from a power source supply separate to the conveyors, each PLC or subsets of PLCs shall be provided with an Uninterruptible Power Supply (UPS), where the failure of a power feed to the PLC (including UPS) keeps a minimum of fifty percent (50%) of sub-systems operating, such that baggage can continue to be transported from ticketing through critical sub-systems (Screening, etc.) to the makeup area.

H. PLC Functions

a. The BHS Contractor shall provide a complete CBIS/BHS control system as part of the Scope of Works required under this Contract including, but not limited to the following functionalities;

- Start-up
  a. All baggage handling equipment that can start automatically shall be fitted with audible and visual warnings of start-up.
  b. Down-stream equipment lines/sub-systems shall be provided with automated start-up functions such that equipment is operating and running at full speed prior to a bag leaving the up-stream conveyor. The BHS Contractor shall ensure that bags are not discharging onto a stopped conveyor, shall avoid any cascade/dieback and any impact to the bag tracking, throughput and spacing.
  c. Conveyors shall start in a reverse cascade manner such that the starting of adjacent conveyors are delayed by a small time period to minimize inrush current on the electrical distribution equipment caused by the simultaneous starting of multiple conveyors.
  d. Conveyor start-up functionality shall maintain/restore baggage separation.
  e. Equipment start-up status shall during the start-up process be shown at SCADA with a unique color coding.
- Shut Down
  a. Equipment provided with control stations with “STOP” functionality shall allow personnel the ability to stop equipment at will. When activated the equipment shall run empty and come to a stop. Security/fire shutter doors shall close.
  m. Photo eyes shall perform auto-stop functions such that when no baggage is being processed, the conveyor sub-systems shall perform a purge (last bag shut down), shut down and become inactive.
  b. Equipment shut-down status (i.e. inactive, disabled, idle) shall be actively displayed via the SCADA with a unique color coding.
- Jam
  n. All photo eyes shall be configured with jam detection functionality to stop all adjacent conveyors whenever the conveyor is running, and the photo eye is blocked for a configurable time (typically six (6) seconds).
  a. Jam detection shall only be active when the respective conveyor is running. If a conveyor stops running as a result of cascade stop or other operational reason, no false jam alarm shall be generated.

o. The conveyor shall be latched stopped such that it does not automatically restart when the bag jam is cleared, and the jam photo eye is no longer blocked. The conveyor shall require activation of a jam reset before a restart is allowed.
b. Equipment jam status shall be shown at SCADA with a unique color coding.

- Cascade Stop
  p. All conveyors shall have functionality to stop and queue baggage whenever the head end photo eye becomes blocked, and the downstream conveyor is not operating. The conveyor shall restart automatically after the downstream conveyor has restarted and after a short delay has expired in order to restore baggage separation that may have been compromised when the conveyor cascade stopped.
  a. Cascade stops on inclines/declines shall not cause rolling bags on belt conveyors.
  q. Head end photo eyes shall be positioned at a location such that the conveyor comes to a complete stop before the bag is transferred onto a stopped conveyor or is in transition between two (2) conveyors.
  r. Conveyors at the end of a line shall have functionality to stop the conveyor whenever the head end photo eye becomes blocked causing upstream conveyors to cascade/dieback.
  b. Equipment cascade stop status shall be shown at SCADA with a unique color coding.
- Lamp Test
  a. Provide functionality that allows personnel to inspect the operation of all indicator devices in power panels, control panels and control stations.
  b. All lamps within a sub-system (i.e. controlled by the MCP) shall illuminate when the “LAMP TEST” pushbutton is activated. The lamps shall continue to illuminate for a User Configurable time or until the same “LAMP TEST” pushbutton is pressed again.
  c. It shall be possible to test the bulb of individual indicator lamps/lights by pushing the pushbutton and the lamp/light shall illuminate for the time the pushbutton is pressed.
- Operational Pause / Instant Stop
  a. Using the Operational Pause / Instant Stop functionality, it shall be possible for Users to instigate an immediate line stop.
  b. To resume operation after an Operational Pause / Instant Stop the User shall perform a START.
- Energy Conservation - Intelligent Power Saving (IPS)
  a. Public area conveyors shall not have an Intelligent Power Saving function (e.g. Claim carousels, Ticketing take-away belts), but be provided with the Sub-System Energy Conversation mode.
  b. Non-public conveyors shall each be provided with intelligent power saving (IPS) software such that a conveyor stops when no bags are being transported on the conveyor and a configurable number of upstream conveyors. For long conveyors immediately downstream of short conveyors (queue belts, power turns, and so on) shall look further upstream than the long conveyor to minimize unnecessary stopping and starting operations.
  c. Wherever possible, IPS shall consider bags on upstream conveyors using tracking information, to avoid the downstream conveyor stopping and then immediately starting due to arriving baggage so as to avoid unnecessary stop/starts while ensuring energy is not wasted.

d. Wherever the BHS Contractor performs software modifications on an existing conveyor line the IPS functions for all conveyors on that conveyor line shall be modified to be fully compliant with the IPS functionality described in these Specifications.
e. Each IPS shutdown timer shall be independently User Configurable.
f. IPS timers shall be configured to ensure that a conveyor cannot perform more than a maximum number of stop/starts per minute dependent on the conveyor type (e.g., conveyors not designed for high cycling functions shall be limited no more than six (6) stop/start operations per minute).
g. When an upstream bag approaches a stopped conveyor, the stopped conveyor shall restart such that the stopped conveyor is at full operating speed prior to the bag transferring onto the previously stopped conveyor, without stopping the upstream conveyor (dieback).
h. When conveyors are operating in IPS mode, visual warning devices along the line shall operate periodically to alert personnel in the area that the conveyor is operating, and correct equipment status shall be shown at SCADA with a unique color code for IPS mode.
i. Energy conservation shall be deemed to have been interrupted whenever an emergency stop device has been activated in the sub-system and restart of the equipment shall follow procedures for emergency stops.

- Energy Conservation - Sub-System Energy Conservation
  a. Sub-systems shall be provided with energy conservation functions.
  b. Individual sub-systems shall shut down after a User Configurable (1-30 minutes) time period (typically as specified below unless otherwise noted), whenever the sub-system is not processing baggage.
  c. The default shutdown time period for zones with Access Readers shall typically be five (5) minutes.

Table 34: Sub-System Energy Conservation

Sub-System	Time-Out Duration
Ticketing / check-in	10 min
Claim carousels	15 min
Transport lines / Others	10 min
Make-up carousels	30 min

d. Once conveyors have stopped and are shut down due to sub-system energy conservation, associated security/fire doors shall close automatically.
e. Techniques shall be employed to ensure that bags are not stranded on conveyor lines.
   1) Take-Away Ticketing
      a) Ticketing conveyors in the public area shall have multiple zones such that upstream conveyors not being used by a ticketing agent do not continue to operate. Typically, a single zone shall be created for each conveyor that ticketing agents load baggage onto.
      b) When all timers in a ticketing sub-system have expired or all Access Readers are inactive, the ticketing sub-system shall shut down and the security door(s) shall close.
      a) Shutdown timers associated with each zone shall reset whenever a photo eye on the conveyor is blocked by baggage. Only photo eyes within a zone shall reset zone timers.

c) An active upstream zone shall keep all downstream conveyors operating.
d) When a timer in a zone has expired and the upstream zone is shut down, the zone shall also shut down and the security/fire door as appropriate shall close.
e) When a zone times out, the start button shall extinguish and require personnel to obtain authorization by the Airport Security Authorization System (e.g. Access Reader) before allowing an operator to start the zone and open the security/fire door.

- Equipment Status
  a. General
     1) As a minimum the following equipment status shall be monitored and displayed in local and central visualization screens (SCADA).
  b. Status Monitoring
     1) Equipment running
     2) Jams
     3) Die-back
     4) Energy save
     5) Emergency stop
     6) Motor overload
     7) Oversize detection
     8) Abnormal operation of the motor contactor
     9) Abnormal operation of the interface to the Clutch/Brake module (clutching when braking is required or clutching and braking at the same time).
     10) Abnormal operation (out of tolerance) of a shaft encoder
     11) Encoder pulses
     12) PEC status (blocked, unaligned, OK)
     13) Reverse running direction
     14) Operator stop
     15) Equipment locked in one (1) position
     16) Automatic/maintenance mode
     17) Other fault conditions that stop equipment
  c. Local Visualization
     1) To assist personnel with the in-field control and monitoring of the system provide local visualization of equipment status. The functionality of the local visualization shall be independent of the HLC, i.e. it shall continue to operate despite any HLC failure.
     2) The local visualization of the equipment controlled by a PLC shall use the same Tier 2 Sub-system screen as used for the particular PLC in the central visualization.
     3) The dynamic display of equipment status shall use the same color coding and equipment symbols as for the central visualization screens.
     4) The local visualization shall allow display of equipment status and alarm messages. The number of latest alarm messages shown shall be configurable (3 default). It shall be possible to turn on/off the display of alarm messages and it shall be possible to maximize the alarm window to use the full monitor. The operator shall be able to scroll through the last 24 hours of alarm messages (unless the PLC has been rebooted).

5) The User shall be able to acknowledge alarms and create comments to alarms via the touch screen. It shall be possible to filter alarms similar to filtering on the central visualization.
6) Each status map shall only display the equipment controlled by the particular PLC, i.e. it is not necessary to allow navigation to adjacent PLC zones as done in the central visualization.
7) Provide a soft keyboard functionality to assist the User with login, enter alarm comments, and apply filtering constraints.
8) Allow Users to pull up the color coding legend and equipment symbol legend screens on demand.
9) Perform an automatic logout of the User if the status map has been inactive for a configurable time (default 10 minutes). Upon automatic logout the status map shall revert to showing the local visualization screen and alarm messages.
10) The touch screen shall go into energy saving mode after 20 minutes of inactivity. Upon activation of the touch screen it shall become operational and show equipment status again.
11) User login is required to acknowledge alarms or provide any form of User inputs.

d. Warning Devices (Stacked Lights, Light Beacons, & Audible Horns)
1) Audible and visual warning devices shall be located at intervals along the conveyor such that they alert personnel in the area of the status of the equipment, e.g. faults, equipment startup conditions, jam conditions, equipment full conditions, E-stop conditions and so on as coordinated with the Owner.
2) An audible and visual warning device shall be positioned in the immediate vicinity of potential jam points. Where multiple potential jam points are located within close proximity of one another, one warning device centrally located shall be sufficient.
3) Warning devices shall operate independently of each other based on the status of the sub-system or equipment, which they represent.
4) An audible and visual warning device shall operate in the immediate area of a conveyor fault.
5) Light beacons shall continue to operate until the fault condition has been cleared.
6) The audible device shall operate for 10 seconds in every 30 seconds or until an operator activates an alarm silence pushbutton in the immediate area in which case the audible alarm shall be silenced. A new fault in the area shall reactivate the audible alarm.
7) A visual warning device shall operate continuously whenever an emergency stop device in the area is activated.

PART 3 - Execution Requirements

3.1 Quality Control

A. General
- The BHS Contractor shall have his Quality Control Program in place to ensure that all materials and Works are completed in compliance with Contract Documents. The BHS

Contractor is solely responsible for Quality Control with the exception of those tests and/or audits that may be conducted by the Owner.

- The BHS Contractor is obligated to correct or remove non-conforming materials, whether in place or not. If necessary, the Owner will send written notification to the BHS Contractor to correct or remove the defective materials from the project. If the BHS Contractor fails to respond, the Owner may order correction, removal and/or replacement of defective materials by others, in which case the BHS Contractor shall bear all costs incurred by such actions.
- In the event that the BHS Contractor fails to address QA issues in a timely manner, the Owner reserves the right to delay/stop the Works until such time as the BHS Contractor addresses in full all outstanding QA issues to the satisfaction of the Owner, the Owner has inspected the Works and approved Works/construction to continue. All costs/time associated with the delay shall be borne entirely by the BHS Contractor and no additional time shall be granted. The BHS Contractor is required to absorb the delay by working longer hours or increase manpower to meet the project schedule.

B. Documentation

- The BHS Contractor shall not change or alter approved submittals, procedures, Specifications, drawings or other pertinent documentation without the Owner's written authorization.
- All records and documents that are quality related shall be prepared, identified, and maintained by the BHS Contractor and shall be made available to the Owner upon request. Records shall be protected from damage, deterioration, or loss. A copy of the records and documents shall be maintained at the Works site at all times unless the Owner has approved other locations in writing. Retention time for all quality records shall be not less than three (3) years from the date of Final Completion and Acceptance of the Works.
- The BHS Contractor shall maintain records at the actual worksite and at the BHS Contractor's office to show the inspection status of materials and items installed in order to ensure that the required inspections and tests have been performed in a timely and correct manner.

C. Quality Inspections and Tests

- Inspection and tests, conducted by persons or agencies other than the BHS Contractor, shall not in any way relieve the BHS Contractor of his responsibility and obligation to meet all Specifications and the referenced standards.
- The BHS Contractor's designated Quality Control Manager shall inspect the Works and shall ensure the Works complies with the contract requirements prior to any requests for inspection or testing.
- Initial Inspection
  a. Upon completion of a representative sample of a given feature of the Works and no later than two (2) weeks after the start of a new or changed operation, the Owner and/or the Owner's designated representatives shall meet with the BHS Contractor's Quality Control Manager and applicable sub-contractor's supervisor and their Quality Control representatives to check the following items, at a minimum:
     1) Inspection Items
        a) Workmanship to established quality standards.
        b) Conformance to Contract Drawings, Specifications, and the accepted shop drawings
        c) Adequacy of materials and articles utilized.

d) Results of inspection and testing methods.
e) Adequacy of as-built drawings, which shall be maintained daily.

b. Once accepted, the representative sample will become the physical baseline by which ongoing Works is compared for quality and acceptability. To the maximum practical extent, approved representative samples of Works elements shall remain visible until all Works in the appropriate category is complete. Acceptance of a sample does not waive or alter any contract requirements or show acceptance of any deviation from the contract not approved in writing by the Owner.

- Follow-up Inspection
  a. The BHS Contractor's Quality Control representative will monitor the Works to review the continuing conformance of the Works to the workmanship standards established during the preparatory and initial inspections.

D. New Equipment
- All materials required for the contract shall be new except as submitted, reviewed, and accepted by the Owner.
- Defective or damaged materials shall be replaced or repaired, prior to Substantial Completion, in a manner acceptable to the Owner and at no additional cost to the Owner.

E. Punch List
- The BHS Contractor shall maintain a Punch List throughout the project, which shall be categorized using the below categories.
  a. Major items
     1) Safety
     2) Performance
     3) Availability
     4) Reliability
     5) Functionality
     6) Quality
     7) Secure function
     8) Restricted Maintenance access
     9) Ergonomics
  b. Punch List Minor items
     1) Defects not covered by the Major Item category at the Owner’s sole discretion.

3.2 Safety

A. General
- All safety precautions during the construction process are the responsibility of the BHS Contractor. The BHS Contractor is responsible for the health and safety of his employees, agents, sub-contractors and their employees, visitors, and other persons on the worksite; for the protection and preservation of the Works and all materials and equipment to be incorporated therein; and for the worksite and the area surrounding the worksite. The BHS Contractor shall take all necessary and reasonable precautions and actions to protect all such persons and property.

3.3 New Work to Complete

A. General
- The system shall be properly commissioned by the BHS Contractor prior to System Acceptance Testing.
- The system shall be tested in accordance with procedure identified in Part 2 and Part 3 of this Specification.

B. Screening
- Conveyors, screening equipment and integration in the screening sub-systems shall be provided in accordance with the Contract Drawings.
- The BHS Contractor shall coordinate with the screening equipment supplier to properly integrate the EDS screening machines into the CBIS/BHS in order to provide the functions defined in Part 1 of this Specification.
- Control equipment and functions shall be provided as defined in Part 1 and Part 2 of this Specification.

C. Make-up
- Conveyors, security/fire doors and related equipment in the Sortation and Make-up areas shall be provided in accordance with the Contract Drawings.
- Control equipment and functions shall be provided as defined in Part 1 and Part 2 of this Specification.

3.4 Work Constraints

A. Site Constraints
- Access to the project shall be generally as indicated in the Contract Documents. Access shall be organized and planned by the BHS Contractor to ensure no disruption of airline or airport operations.
- Access to work sites will be strictly monitored and must comply with the Airport Operations and FAA Regulations. The BHS Contractor shall provide monitoring and escorts as required by the Owner's Operations in the area of the Works.

B. System Interruptions
- System interruptions shall not be considered if the interruptions interfere with airport operations or tenant operations. If interruptions cannot be avoided, the BHS Contractor shall coordinate with the Owner (see below). Interruptions or system shut down shall be limited to the hours of 23:00 and 05:30 and need to be coordinated with the Owner.

3.5 Phasing of the Works

A. General
- The BHS Contractor shall phase the Works in accordance with the approved phasing drawings supplied for the contract.
- Any interference requiring a deviation from the approved phasing drawings in order to complete Works shall be brought to the attention of the Owner within 48 hours of the

interference being identified. A detailed plan shall be submitted by the BHS Contractor in writing to the Owner identifying, in detail, how to resolve the interference.

- Works defined in the BHS Contractor's deviation plan shall only commence after the Owner has reviewed the plan and provided approval in writing. The BHS Contractor shall clearly identify any slippage to the project schedule as a result of the deviation and shall make every effort to minimize slippage. Every effort shall be made to bring the project back onto schedule in the shortest possible time frame.

3.6 Contract Records

D. General

- The BHS Contractor shall maintain, at the worksite, on a current basis, one (1) record copy of all drawings, Specifications, addenda, Change Orders, approved shop drawings, working drawings, product data and samples in good order and marked currently to record all changes made during construction.
- Maintain at the field office or on an online document source, one (1) copy of the following record documents:
  a. Contract Documents
     1) Contract Drawings with all clarifications, requests for information, directives, changes, and as-built conditions clearly posted.
     2) Contract Specifications with all clarifications, requests for information, changes, directives, and record of manufacturer actually used along with product trade name.
     3) Reference standards in accordance with Specifications Section 01091.
     4) Affirmative Action Plan and documents.
     5) One (1) set of drawings. The drawings shall reference the applicable submittal.
     6) Field changes of dimensions and details including as-built elevations and location (station and offset).
     7) Details not on original Contract Drawings, but obtained through requests for information or by other communications with the Owner.
  b. BHS Contractor Records
     1) Certificates of compliance for materials used in construction
     2) Completed inspection list
     3) Inspection and test reports
     4) Test procedures
     5) Approved submittals

3.7 Mobilization

A. General

- Provide personnel, products, construction materials construction tools, equipment, materials and supplies of the type and quantities that will facilitate the timely execution of the Works. The delivery shall be accomplished in conformance with local governing regulations.

3.8 Shipping

A. General
- The BHS Contractor shall ship all equipment, materials, and supplies to the Site and make all necessary receiving inspections.

3.9 Equipment Delivery, Storage and Handling

A. General
- Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter, and also protect equipment during all phases of installation and commissioning on the site. Methods of storage of materials shall protect the materials from damage, weather, rust, air-borne grit, and other construction debris. Deteriorated equipment shall not be installed and be replaced by the BHS Contractor at no cost to the Owner.
- Consider the safety of the Works and that of the people and property on and adjacent to the worksite when determining amount, location, movement and use of materials and equipment on worksite.
- The BHS Contractor is responsible for all equipment in storage, including damage and shrinkage. The BHS Contractor shall provide security staff and inventory control staff at his storages.

B. On-Site Construction Storage
- It should be anticipated that the BHS Contractor may be required to stage and store materials at a site remote from the terminal building, if the space allocated by the Owner is not sufficient for the BHS Contractor's needs.
- The BHS Contractor shall coordinate with the Owner for an on-site storage area.
- Storage of equipment/materials shall not under any circumstances interfere with baggage operations and/or the operation of tenants.
- The BHS Contractor shall relocate the on-site storage area from time to time as directed by the Owner at the expense of the BHS Contractor.

C. Off-Site Storage
- The BHS Contractor shall be required to provide off-site storage at his cost.

D. Handling
- Avoid bending, scraping, denting, or overstressing products. Protect projecting parts by blocking with wood, by providing bracing or by other approved methods.
- Protect products from soiling and moisture by wrapping or by other approved means.
- Package small parts in containers such as boxes, crates, or barrels to avoid dispersal and loss. Firmly secure an itemized list and description of contents to each container.

E. Transportation
- Conduct the loading, transporting, unloading and storage of products so that they are kept clean and free from damage.

3.10 Substitutions

A. General
- The Request for Substitution form shall be used when the BHS Contractor wishes to substitute an approved or agreed upon item after the BHS Contractor receives the Notice to Proceed.
- If the substitution changes the Scope of Works, Contract Cost or Contract Time, a Change Order is required.
- As-built drawings and Specifications must include all substitutions even if a Change Order is not issued.
- By submitting a Request for Substitution, the BHS Contractor waives all rights to claim for extra cost or change in contract time other than those outlined in the request and approved by the Owner. The BHS Contractor, by submitting a Request for Substitution, also accepts all liability for cost and scheduling impact on other contractors or the Owner due to the substitution.

B. Procedure for Substitutions
- A complete Request for Substitution must be made at least 60 days prior to when an order needs to be placed, or a method needs to be changed.
- The submittal shall contain, as appropriate, detailed product data sheets for the specified items and the substitution. Samples and shop drawings shall also be submitted if the substitution as applicable. The submittal shall contain all the data required to be submitted for acceptance of the originally specified item or process.
- The formal Request for Substitution will be evaluated by the Owner and the Designer of Record based on the following criteria:
  a. Evaluation Criteria
     1) Compatibility with the rest of the project
     2) Reliability, ease of use and maintenance
     3) Both initial and long-term cost
     4) Schedule impact
     5) The ability of the item or process to meet all applicable governing regulations, rules, and laws along with funding agency requirements
     6) The cost of evaluating the substitution.
- Based upon the above evaluation the Owner will make a final determination of what is in the best interest of the Owner and either approve, disapprove, or approve as noted the requested substitution.

C. Site Access and Temporary Controls
- Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- Do not close or obstruct roads, streets, walks, walkways, or other adjacent occupied or used facilities without written authorization from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways, if required by governing regulations.
- Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.

D. Temporary Facilities

- Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities.
- Provide protection to ensure safe passage of people around selective demolition area, and to and from occupied portions of buildings.
- Provide temporary weather protection during intervals between selective demolition operations of existing construction on exterior surfaces and new construction to prevent water leakage and damage to structure and interior areas.
- Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
- Cover and protect furniture, furnishings and equipment that have not been removed.

E. Temporary Enclosures
- Provide temporary enclosures for protection of existing buildings and construction projects, both in progress and completed, from exposure, weather, and other construction operations.
- Provide temporary weatherproof enclosures for building exteriors.
- Where heating or cooling is needed and permanent enclosures are not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

F. Temporary Partitions
- Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

3.11 Protection

A. General
- The BHS Contractor shall ensure that Works in progress is protected against damage until Substantial Completion and/or Beneficial Use, whichever occurs first.
- The BHS Contractor shall ensure that his Works does not impact the Works of other trades/tenants working in the area. Any Works damaged by the BHS Contractor shall become the BHS Contractor's responsibility to repair as directed by the other trade.
- Any building and/or structural members damaged by the BHS Contractor shall be inspected and a written report identifying rectification Works certified by an approved expert shall be submitted to the Owner. Works shall only be undertaken when approved by the Owner in accordance with the General Conditions of Contract.

3.12 Work by Others

A. General
- The BHS Contractor is notified that there may be other construction activities within the project area and at other locations at the airport throughout the duration of this Contract.
- It is the BHS Contractor's responsibility to keep appraised of such projects and how they may affect the Works. The BHS Contractor shall maintain contact with the Owner and with other contractors and schedule Works so as to minimize the effect of such construction and activities.

3.13 Site Coordination

A. General
- The BHS Contractor shall perform site coordination with the Owner, Main Contractor, Airlines, Authorities, Sub-contractors, and other trades.
- In coordinating work performed by others, the BHS Contractor shall obtain and refer to equipment locations and other layouts, as available, to avoid interface problems.

3.14 Demolition

A. General
- Demolish and remove existing construction only to the extent required by new construction and as indicated in the contract documents.
- All demolition shall be performed in a safe and controlled manner.
- The BHS Contractor shall ensure that operational equipment is not damaged, obstructed or otherwise taken out of service due to demolition activities.

B. Dust/Protection Barriers
- Prior to any demolition the BHS Contractor shall construct area containment doors and dust barriers at five (5) feet outside the limits of demolition of the wall and as directed by the Owner.
- Dust barriers for wall demolition shall be constructed of metal studs with ½" painted drywall from floor to ceiling. At a minimum, any space containing electrical or telecommunications equipment will require dust barriers for the entire space during demolition and construction.
- The BHS Contractor shall construct code-approved and Owner-approved dust and debris barriers covering equipment that is to be modified. Barriers shall be constructed to allow emergency ingress and egress to and from equipment and spaces. Barriers shall be constructed to allow continual uninterrupted function of building equipment and spaces.
- The BHS Contractor shall install all required modifications to exit/egress signage until temporary barriers are removed.
- The BHS Contractor shall coordinate partition location with the Fire Sprinkler contractor to ensure adequate sprinkler coverage during construction. Temporary barriers shall be removed only after completion of the work scope within the areas including final Punch List activities. Areas between ceilings and structure above shall be contained to prevent migration of any dust into adjacent areas.
  a. HVAC system containment
     1) The BHS Contractor shall submit to the Owner maintenance HVAC and fire alarm shut down requests prior to modifications to the area of work for dust containment. The HVAC system shall be interrupted, re-routed, or blocked off to prevent dust from entering return or supply ducts.

C. Removed and Salvaged Items
- Clean all removed and salvaged items.
- Pack or crate items after cleaning. Identify contents of containers.
- Store items in a secure area until turned over to the Owner.
- Transport items to the Owner's storage area as designated by the Owner.
- Protect items from damage during transport and storage.

D. Removed and Reinstalled Items
- Clean and repair items to a functional condition adequate for the intended reuse.
- Paint equipment to match new equipment.
- Pack or crate items after cleaning. Identify contents of containers
- Protect items from damage during transport and storage.
- Reinstall items in locations indicated in the schedule. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make the items functional for the use indicated.

3.15 Removal

A. BHSC to coordinate with Owner to see what components are to be deconstructed and remain as spare parts. All items not coordinated will remain set for demolition and removal.

B. General
- The BHS Contractor shall promptly dispose of demolished materials and construction debris from the construction site and arrange for appropriate disposal. Do not allow demolished materials to accumulate on-site.
- Do not burn demolished materials.
- At the end of the installation phase, all unnecessary construction material shall be removed from site.

3.16 Cleaning (House Keeping)

A. General
- Maintain the worksite in a neat, orderly, and hazard-free manner in conformance with all federal, state and local rules, codes, regulations and orders, including all OSHA requirements, until Final Completion and Acceptance of the Works and the BHS Contractor has vacated the site.
- Keep catwalks, underground structures, worksite walks, sidewalks, roadways, and streets, along with public and private walkways adjacent to the worksite, free from hazards caused by construction activities. Inspect these areas regularly for hazardous conditions caused by construction activities.
- The BHS Contractor shall not use Owner controlled dumpsters or other contractor's dumpsters for material removal.

B. Hazardous Waste
- Store volatile waste in covered metal containers and remove those wastes from the worksite daily.
- Do not accumulate waste which creates hazardous conditions.

C. Interim Cleaning
- Clean the worksite every shift/workday for the duration of the construction contract. Maintain structures, grounds, storage areas and other areas of worksite, including public and private properties immediately adjacent to worksite, and keep them free from accumulations of waste materials caused by construction operations. Place waste materials

in covered metal containers. All hard concrete, steel, wood, and finished walking surfaces shall be swept clean daily.

- Remove or secure loose material on open decks and on other exposed surfaces at the end of each workday or more often in a manner that will keep the worksite hazard free. Secure material in a manner that will prevent dislodgment by wind and other forces.
- Cleaning shall be done in accordance with manufacturer's recommendation.

D. Final Cleaning

- Inspect interior and exterior surfaces, including concealed spaces, in preparation for completion and acceptance.
- Remove dirt, dust, litter, corrosion, solvents, misplaced paint, stains, and extraneous markings.
- Remove surplus materials, except those materials intended for maintenance.
- Remove all tools, appliances, equipment, and temporary facilities used during the construction.
- Remove detachable labels and tags. File them with the manufacturer's specifications for that specific material for the Owner’s records.
- Repair damaged materials to the specified finish or remove and replace.
- Final clean up applies to all areas, whether previously occupied and operational or not.

3.17 Preventive Maintenance During Contract Execution

A. General

- The BHS Contractor shall provide preventive maintenance of the complete CBIS/BHS system from commencement of Pre-Commissioning activities until Beneficial Use/Substantial Completion following the standard recommended maintenance guidelines for the CBIS/BHS equipment provided.
- Upon Beneficial Use/Substantial Completion to the Owner the CBIS/BHS equipment shall be in near new condition and all maintenance activities shall be up-to-date.

3.18 Installation

A. General

- The requirements of the latest edition of the “OSHA construction standards” shall be followed by all BHS Contractors, fabricators, and suppliers.
- All Works for the construction and installation of the CBIS/BHS shall be in accordance with all codes and standards and local laws and regulations, applicable to the design and construction of this type of equipment, which are generally accepted and used as good practice throughout the industry. I.e., NFPA, Underwriter’s Laboratories, OSHA, SAE publications, National Electrical Code (NEC), American National Standards, etc.

B. Installation Tolerances

- The maximum allowed gap between adjacent end rollers on consecutive conveyors shall not exceed 1” with ½” being the installation objective.
- Adjacent equipment shall be installed true and parallel to each other. Any angle off-set shall be kept to a minimum and shall not exceed 1/8” over the width of a standard size conveyor (42”).

C. Vibration
- Provide all mounted components (pulleys, sprockets, rollers, and so on) with methods to prevent the loosening of the component (e.g., snap rings, cotter pints).

D. Spot Painting
- All works-applied paint which is damaged during the erection process shall be made good and all bare patches touched up the satisfaction of the Project Manager and in accordance with the recommendations of the paint manufacturer before work in other trades connected with the item is commenced.

E. Belt Tracking
- Belt tracking shall be accomplished using a method, which does not induce unequal belt edge tensions.

F. Sideguards
- Sideguards shall be flared down-stream.
- Punched and dimpled PEC holed from inside of conveyor toward the outside. PEC reflectors shall be fully visible by the PEC. Reflector shall be free of mounting bolts/screws.
- Sideguards shall not contain any catch points.
- Transitions between sections shall be smooth.
- Sideguards shall have thirty (30°) degree transition pieces at change of sideguard heights
- Sideguards shall be bolted together. Butt joints are not allowed.

G. Conduit
- Size conduit for conductor type installed or for Type THW conductors, whichever is larger, ¾" minimum size. For communication, 1" is the minimum.
- The maximum size conduit in slabs above grade shall not exceed ¾".
- Conduits crossing each other may not be larger than ¾".
- Exposed conduits shall be rigid steel for installations 8'-0" above floor, deck or grating except in electrical, communications and mechanical rooms.
- Thread rigid conduit with Standard National Pipe Thread threading dies. Engage a minimum of five (5) threads on all connections; use an approved pipe dope for all connections except where lock nuts are used.
- All vibrating equipment such as motors, transformers, and generators shall be connected with flexible steel conduit.
- Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps.

H. Wire-Ways/Cable Trays
- Wire-ways/cable tray and cable tray supports shall not be used to support conduits or other equipment. Cable tray and cable tray supports "shall stand alone."
- Wire-ways/cable tray shall not be installed in stairways or on the exterior of any building.
- Arrange wire-ways to maintain headroom and present a neat appearance.

I. Copper Wiring
- All conductors shall be copper.

- Wiring shall be installed only after conduits have been cleaned and a continuity test has been performed.
- All power cables (480 VAC) cables shall be enclosed in separate wire-ways/conduit to low voltage controls cables, communication cables and LAN cables. Adequate cable segregation with metallic dividers or shielding to prevent noise and signal interference shall be provided. Where low voltage and communication cabling needs to cross power cabling, it shall cross perpendicular.

J. Cable Installation
- Provide protection for exposed cables subject to damage.
- Use suitable cable fittings and connectors.

K. Wiring Connection and Terminations
- Electrical connections shall be installed in accordance with equipment manufacturer's written instructions and with recognized industry practices, and comply with applicable requirements of UL, NEC and NECA's "Standard of Installation" to ensure that products and their installation fulfill requirements.

L. VFD
- The BHS Contractor shall take special precautions with the installation of VFD's to ensure that the cable length between the motor and VFD is as short as possible.
- The cable between the motor and VFD shall be shielded.

M. Motor Control Panels (MCP)
- Motor control panels shall consist of floor-mounted code gauge sheet steel, painted or powder coated enclosures with hinged doors, handles, and locks.
- MCP's shall be fully enclosed, suited to the environment where they are located.
- MCP's shall be properly secured in place on panel manufacturers standard steel base plinths bolted to the floor. A minimum of four (4) anchors shall be used.
- Air flow shall be filtered to remove airborne particles.
- The BHS Contractor shall ensure that there is a minimum of 3'-4" in front of any panel to the nearest opposing equipment to provide safe operator access.

N. Grounding
- Upon completion of installation of electrical grounding system, test ground resistance to earth in accordance with ANSI / IEEE 81 submit test results to the Owner.

O. Equipment Identification
- The BHS Contractor shall ensure that all equipment is marked and identified in a consistent and logical manner.
  a. Cable/Conductor Identification
     1) The application of cable/conductor identification, with circuit number, on each wire / cable in each box/enclosure/cabinet/panel is required. The identification shall match the marking system used in panelboards, shop drawings, and Contract Documents.
     2) All cabling (power, controls, and communications) shall be properly identified at both ends of the cable with machine printed labels or identification markers. The use of handwritten labels/markers is not allowed.

3) Markers are to be affixed on each terminal conductor, as close as possible to the point of connection.

b. Equipment/System Identification
1) An engraved, plastic laminate sign is to be provided on each unit of electrical equipment furnished; for units including central and master units and also for all electrical systems including communication, control, signal, and alarm.
2) Provide a single line of text when possible and multiple lines when required. Letter height shall be as specified herein, black lettering on white field for normal and white letters on a red field for emergency.
3) Provide text matching terminology and numbering of the Contract Documents and shop drawings. The sign shall include unit designation, source circuit number, circuit voltage, and other data specifically indicated. Also, the sign shall indicate normal source circuit number ("Fed from . . .") and emergency source circuit number when the equipment is a transfer switch or fed directly from a transfer switch.
4) Include signs for each unit of electrical work.
5) All panel boards shall have a typed panel schedule indicating the date, BHS Contractor, type of equipment served and its location.

P. Definition of Installation Completion
- In order to measure progress accurately the following must have been completed by the BHS Contractor for installation to be considered complete.

a. Mechanical Installation Complete
1) All supports and vibration damping installed
2) All mechanical safety equipment installed.
3) All conveyor frames, slider beds, rollers, pulleys, take-up sections complete
4) All belts are installed.
5) All sideguards and sideguard transition pieces are installed.
6) All under guarding is installed.
7) All finger guarding is installed.
8) All motors and gearboxes are installed.
9) All gap pans are installed.
10) All drip pans are installed.
11) All carousels are complete with frames, supports, cladding, slats, finger guarding, baggage bumpers, transition plates, kick plates, drives, chain, drive disassembly rails, chain adjusted.
12) All touch up painting has been completed.
13) All equipment labeling is complete.

b. Electrical and LLC Installation Complete
1) All MCPs, PLC and power distribution panels have been installed with associated electrical devices, operators, relays, switches, and touch screens. Panel lighting is operational.
2) All communication bus, couplers, repeaters, routers, and connectors have been installed.
3) All PEC, shaft encoders, light curtains, proximity sensors, limit switches and other sensory equipment has been installed and connected to controls.
4) All rigid and flexible conduit and cable trays have been installed.
5) All electrical, power, control, sensory and safety equipment including security and customs screening machines has been terminated and labeled.
6) All equipment disconnectors have been installed.

7) All equipment controllers, VFD and soft starters have been installed.
8) All beacons and audible horns have been installed.
9) All control station have been installed.
10) All displays have been installed.
11) All E-stop pushbuttons, lanyards and press lines have been installed and operational.
12) All controls label plates are installed.
13) All SCADA visualization status screens are available and functional.
14) All SCADA dialogues are available and functional.
15) All reports are available and functional.
16) All wire labeling has been completed.
17) All action list items have been completed and closed out.

3.19 Pre-Commissioning

A. General

- After the installation of equipment, the BHS Contractor shall perform the necessary inspections and checks to verify that the installed equipment can operate safely and according to intended purposes as preparation for the following BHS Contractor commissioning activities.
- Pre-Commissioning shall be performed by the BHS Contractor in a structured and meticulous manner to verify proper installation. The BHS Contractor shall develop and execute a detailed Pre-Commissioning Plan, which shall follow the below structure and contain the listed checks, inspections, and tests at a minimum.
- The BHS Contractor shall develop methods and procedures to capture information and results of all pre-commissioning activities. Such information shall be transmitted to the Owner for information.
  a. Required Pre-Commissioning Documentation
     1) Provide completed check lists
     2) Data recordings
     3) Sequential log files
     4) Trends

3.20 Commissioning

A. General

- Following pre-commissioning, the BHS Contractor shall perform the necessary testing in order to commission and verify the correct and proper operation, performance and functionality of the individual components, sub-systems and the complete system as a whole before the BHS Contractor invites the Owner to witness System Acceptance Tests.
- Commissioning shall be performed by the BHS Contractor on a building block basis performing basic tests first to verify proper installation, followed by more complex and integrated tests to verify proper operations. The BHS Contractor shall move from one testing block to the other only after demonstrating the successful completion of the current testing block.
- The BHS Contractor shall develop and execute a detailed Commissioning Plan, which shall follow the below structure and contain the listed checks, inspections, and tests at a

minimum. The omission of specific tests below shall not relieve the BHS Contractor from conducting such tests to ensure compliance with the contract requirements.

- The BHS Contractor shall develop methods and procedures to capture information and results of all commissioning activities, such that functions and procedures can be properly verified. Such information shall be transmitted to the Owner for information.
  a. Required Commissioning Documentation
     1) Provide completed check lists
     2) Data recordings
     3) Sequential log files
     4) Trends

3.21 Training

A. General

- The BHS Contractor shall train the Owner's personnel in the operation and maintenance of the equipment. The training shall be completed during the System Acceptance Testing such that the Owner's staff can become familiar with the system prior to Practical Completion.
- The training shall cover operation functions of the system and all related sections of the Operations Manual.
- The training program shall be submitted to the Owner for review and approval.
- The BHS Contractor shall provide training to airport representatives in the correct and approved methods for operating and maintaining of the CBIS/BHS to ensure trouble free and sustained operation as defined within this Specification.

B. Training Schedule & Material

- The BHS Contractor shall submit to the Owner for approval a schedule thirty days (30) prior to commencement of training or at the commencement of System Acceptance Testing whichever occurs first.
- The schedule shall consider the working schedule of the persons being trained as well as their availability and shall ensure that all hours of the day and days of the week can be addressed to ensure personnel on shift work or unusual working schedules can be accommodated.
- The BHS Contractor shall provide all materials, equipment (including specialized tools) and resources necessary to properly instruct personnel and train persons in the proper operation, use and/or maintenance of the equipment/components incorporated into the CBIS/BHS. The BHS Contractor shall not rely on the Owner's purchase of equipment (spare parts or specialized tools) necessary to properly operate the CBIS/BHS for training.
  a. Training shall consist of a combination of both:
     1) Classroom instruction.
     2) And hands-on operation including assembly and disassembly.
- The BHS Contractor shall provide workbooks and manufacturers literature as part of the training material that identifies all aspects of the systems being trained. As part of training, extensive reference to the Operations and Maintenance manuals shall be made.
- The BHS Contractor shall be fully responsible for additional training requirements and ensure that additional training requirements are properly incorporated into official schedules and materials for all options taken up by the Owner.
- Training as a minimum shall cover the following disciplines.

a. Safe Operation in and around the Baggage System.
   1) This training shall be general to all personnel who work in close proximity to any CBIS/BHS equipment.
b. General Conveyor Operation
   1) The BHS Contractor shall cover all areas related to conveyor operation including, but not limited to, the following:
      a) Startup and shutdown.
      b) Emergency Stop.
      c) Jams (conveyors, doors, diverters, etc.).
      d) Oversize.
      e) Manual operation of equipment (conveyors, Security doors, carousels, etc.).
      f) EDS fault identification.
c. CBRA and TSA Operation
   1) The BHS Contractor shall cover all areas related to CBRA and TSA operation including, but not limited to, the following;
      a) Access control.
      b) User interface operation.
      c) Startup and shutdown.
      d) Handling of Out-of-Gauge bags.
      e) Handling of Odd-size bags.
      f) Fault detection and reset as directed by the Owner.
d. Make-up Area
   1) The BHS Contractor shall cover all areas related to Make-up operation including, but not limited to, the following:
      a) Startup and shutdown.
      b) Indexing
      c) Fault detection and reset (oversize, jams, etc.).
      d) Handling of Odd-size bags.
e. Operation & System Monitoring
   1) The BHS Contractor shall cover all areas related to CBIS/BHS operation including, but not limited to, the following:
      a) Starting/restarting equipment
      b) Operation of hardware
      c) Understanding the interface and being able to navigate through the different Graphical pages
      d) Proper identification of faults
f. Maintenance
   1) Under direction from the Owner, maintenance training shall be provided to all groups the owner selects.
   2) The BHS Contractor shall cover all areas related to general mechanical components included in the scope of work.
g. Electrical/Controls
   1) The BHS Contractor shall cover all areas related to Electrical/Control components included in the scope of work.

- The BHS Contractor shall maintain a complete and accurate attendance register of all personnel who attend training and submit to the Owner.

3.22 Permits

A. General
- The BHS Contractor shall obtain and pay for all required labor, permits, taxes, insurances, inspection fees and certificates related to all phases of the CBIS/BHS construction.

3.23 Contract Closeout

A. General
- When the BHS Contractor considers that the Works is complete, the BHS Contractor shall submit written certification that:
  a. BHS Contractor Certificates
     1) Works has been inspected by the BHS Contractor for compliance with Contract Documents.
     2) Works has been completed in accordance with Contract Documents.
     3) Works is ready for final inspection by the Owner.
     4) All required as-built documents have been submitted and accepted.
     5) All damaged or destroyed real estate, personal, public, or private property has been repaired or replaced.
     6) All operation and maintenance manuals have been submitted and accepted.
     7) All required training has been completed.
     8) All personnel badges and vehicle permits have been returned to the Airport Security.
     9) All Punch List items have been completed and closed out.

B. Final Inspection
- The Owner will inspect to verify the status of completion with reasonable promptness after receipt of such certifications. The inspection of the Works will be done in accordance with the General Conditions.
  a. Identification of Incomplete or Defective Works
     1) The Owner may, at the Owner's sole discretion, either terminate the inspection or prepare a Punch List and notify the BHS Contractor in writing, listing incomplete or defective Works.
     2) The BHS Contractor shall take immediate steps to remedy stated deficiencies and send a second written certification to the Owner that Works is complete.
     3) The Owner will then reinspect the Works.
  b. Reinspection
     1) Should the Owner perform reinspection due to failure of the Works to comply with the claims of status of completion made by the BHS Contractor:
     2) The BHS Contractor shall compensate the Owner for such additional services at the rate of $75.00 per man-hour.
     3) The Owner shall deduct the amount of such compensation from the final payment to the BHS Contractor.

3.24 Start-up System Monitoring & Support by the BHS Contractor

A. General

- The Start-up System Monitoring & Support provided by the BHS Contractor contains two (2) parts: on-site and off-site support activities.
- The BHS Contractor shall ensure that a robust support process and sufficient resources and procedures are in place to achieve effective startup and daily operations.
- In the event that it during the Start-up System Monitoring & Support period is identified that the CBIS/BHS installation fails to meet the requirements of the Contract Documents, the BHS Contractor shall prepare a detailed rectification plan/schedule and submit such to the Owner for review, comments, and approval. Once the Owner has approved the rectification plan and agreed to the schedule, the BHS Contractor shall complete all rectification work. Once the rectification work has been completed, the BHS Contractor shall notify the Owner and the Start-up System Monitoring & Support period shall restart as a new period for the full duration.

B. On-Site Operational Start-up Support by the BHS Contractor

- During the On-site Start-up Support period the BHS Contractor shall provide the following staff on-site to cover all disciplines:
  a. Disciplines
     1) Mechanical Engineer
     2) Electrical Engineer
     3) LLC Engineer
- The BHS Contractor's on-site support engineers shall have worked in the specialty of responsibility during the construction and commissioning of this project. The BHS Contractor shall submit resumes (curriculum vitae) of all proposed on-site support engineers two (2) months prior to the BHS Contractor's request for Practical Completion.
- The working hours and shift rosters for the on-site support personnel shall be arranged to maximize the shift coverage of the airport's operational hours such that support for each discipline is present at most shifts and to ensure that at any operational hour the BHS Contractor support staff are on-site at all times including weekends.

Table 35 Minimum On-Site Start-up & Support Personnel

Time Period	On-Site Staff
First seven (7) days of Beneficial Use	1
Day eight (8) to end of on-site Support period	1

- Shift rosters and work hours of the support engineers shall be submitted for Owner approval. Each shift shall cover a minimum of eight (8) hours and each engineer shall work five (5) shifts a week.
  a. BHS Contractor Response Times
     1) For durations where the shift rosters of the on-site support engineers prevent the personnel from being present on-site, the BHS Contractor shall ensure the engineering support provides the below response times at all operational times including weekends.

Table 36 Maximum Response Times (1-8 Days)

Period	Response Time
For the first seven (7) days of operations	Telephone response within fifteen (15) minutes of a problem being reported. On site within one (1) hour of a problem not being resolved by telephone support of more than fifteen (15) minutes.

Period	Response Time
Day eight (8) to end of on-site Support period	Telephone response within thirty (30) minutes of a problem being reported. On site within four (4) hours of a problem not being resolved by extended telephone support of more than one (1) hour.

- BHS Contractor On-site Activities
  a. The BHS Contractor shall ensure that suitably qualified personnel are available to support operational problems encountered by the Owner and/or their representative, including, but not limited to, any of the following:
     1) Minimum Support Activities
        a) Support the Owner's operational personnel with the daily operation of the system.
        b) Support troubleshooting and break-down activities.
        c) Investigate and rectify any operational problem identified.
        d) Make necessary adjustments due to inconsistencies/errors.
        e) Support troubleshooting due to software bugs/errors.

C. Off-Site Operational Start-up Support by the BHS Contractor
- Once the on-site support activities have elapsed and the system performs as per these Specifications, the BHS Contractor's monitoring and support regime shall transition to remote off-site support unless issues can't be resolved without physical on-site presence.
- The BHS Contractor's Off-Site Start-up Support shall continue until the end of the General Warranty period.
  a. BHS Contractor Response Times
     1) The BHS Contractor shall ensure that the following maximum response times are provided during the Off-site Start-up Support period for all operational hours of the airport including weekends.

Table 37 Maximum Response Times (9-44 Days)

Period	Response Time
Day fourteen (14) through day forty-four (44) after operations commences	Telephone response within thirty (30) minutes of a problem being reported. On site within eight (8) hours of a problem not being resolved by extended telephone support of more than one (1) hour.
Day forty-four (44) to the end of the General Warranty period after operations commences.	Telephone response within sixty (60) minutes of a problem being reported. On site within twenty (24) hours of a problem not being resolved by extended telephone support of more than four (4) hours.

  b. The BHS Contractor shall ensure that suitably qualified personnel are available to support operational problems encountered by the Owner and/or their representative including, but not limited to, any of the following;
     1) Minimum Support Activities
        a) Adjustment inconsistencies/errors.
        b) Equipment failure/fault.
        c) Improper operation.
        d) Software bugs/errors.
        e) Answer questions to O&M Manual by O&M personnel.

3.25 Demobilization

A. General

- Upon completion of the Works, remove construction tools, apparatus, equipment, unused materials and supplies, plant, trash, and personnel from the jobsite.

End of Section 34 77 16

APPENDIX A

FEDERAL WAGE DETERMINATION

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"General Decision Number: CA20260012 05/18/2026

State: California

Construction Types: Building, Heavy and Highway

Counties: California Counties of
San Luis Obispo

Building Construction Projects
Dredging Projects-Includes Dredging Projects (does not include hopper dredge work)
Heavy Construction Projects (excludes water well drilling)
Highway Construction Projects

Modification Number	Publication Date
2	01/23/2026
3	05/18/2026

ASBE0005-002 07/01/2024

	Rates	Fringes
ASBESTOS WORKERS/INSULATOR (INCLUDES THE APPLICATION OF ALL INSULATING MATERIALS, PROTECTIVE COVERINGS, COATINGS, AND FINISHES TO ALL TYPES OF MECHANICAL SYSTEMS)	$ 56.32	26.52
FIRE STOP TECHNICIAN (APPLICATION OF FIRESTOPPING MATERIALS FOR WALL OPENINGS AND PENETRATIONS IN WALLS, FLOORS, CEILINGS AND CURTAIN WALLS)	$ 39.94	20.65

ASBE0005-002 09/01/2024

	Rates	Fringes
ASBESTOS WORKERS/INSULATOR (INCLUDES THE APPLICATION OF ALL INSULATING MATERIALS, PROTECTIVE COVERINGS, COATINGS, AND FINISHES TO ALL TYPES OF MECHANICAL SYSTEMS)	$ 56.32	26.52
FIRE STOP TECHNICIAN (APPLICATION OF FIRESTOPPING MATERIALS FOR WALL OPENINGS AND PENETRATIONS IN WALLS, FLOORS, CEILINGS AND CURTAIN WALLS)	$ 39.94	20.65

ASBE0005-004 07/04/2022

	Rates	Fringes
ASBESTOS REMOVAL WORKER/HAZARDOUS MATERIAL HANDLER (INCLUDES PREPARATION, WETTING, STRIPPING, REMOVAL, SCRAPPING, VACUUMING, BAGGING AND DISPOSING OF ALL INSULATION MATERIALS FROM MECHANICAL SYSTEMS, WHETHER THEY CONTAIN ASBESTOS OR NOT)	$ 23.52	13.37

BOIL0092-004 01/01/2024

	Rates	Fringes
BOILERMAKER AREA WITHIN A 25 MILE RADIUS OF CITY OF SANTA MARIA	$ 51.98	42.11

BOIL0549-007 01/01/2021

	Rates	Fringes
BOILERMAKER REMAINDER OF COUNTY OUTSIDE A 25 MILE RADIUS OF CITY OF SANTA MARIA	$ 45.60	38.99

BRCA0004-006 05/01/2024

	Rates	Fringes
BRICKLAYER; MARBLE SETTER *THE WAGE SCALE FOR PREVAILING WAGE PROJECTS PERFORMED IN BLYTHE, CHINA LAKE, DEATH VALLEY, FORT IRWIN, TWENTY-NINE PALMS, NEEDLES AND 1-15 CORRIDOR (BARSTOW TO THE NEVADA STATE LINE) WILL BE THREE DOLLARS ($3.00) ABOVE THE STANDARD SAN BERNARDINO/RIVERSIDE COUNTY HOURLY WAGE RATE	$ 45.53	20.29

BRCA0018-008 06/01/2024

	Rates	Fringes
TILE FINISHER	$ 37.96	13.77
MARBLE FINISHER	$ 43.38	15.36

BRCA0018-011 06/01/2023

	Rates	Fringes
TILE LAYER	$ 48.29	19.18

CARP0213-001 07/01/2025

	Rates	Fringes
CARPENTER: (7) TABLE POWER SAW OPERATOR FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL	$ 52.34	26.18
CARPENTER: (6) SCAFFOLD BUILDER FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL	$ 45.37	25.43
CARPENTER: (5) SAWFILER FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL	$ 52.34	26.18
CARPENTER: (4) PNEUMATIC NAILER, POWER STAPLER FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE		

FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL.....$ 52.37 26.18
CARPENTER: (3) PILEDRIVERMEN/DERRICK BARGEMAN, BRIDGE OR DOCK CARPENTER, HEAVY FRAMER, ROCK BARGEMAN OR SCOWMAN, ROCKSLINGER, SHINGLER (COMMERCIAL) FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL. .....$ 52.37 26.18
CARPENTER: (2) MILLWRIGHT FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL.....$ 52.24 26.68
CARPENTER: (1) CARPENTER, CABINET INSTALLER, INSULATION INSTALLER, HARDWOOD FLOOR WORKER AND ACOUSTICAL INSTALLER FOOTNOTE: WORK OF FORMING IN THE CONSTRUCTION OF OPEN CUT SEWERS OR STORM DRAINS, ON OPERATIONS IN WHICH HORIZONTAL LAGGING IS USED IN CONJUNCTION WITH STEEL H-BEAMS DRIVEN OR PLACED IN PRE- DRILLED HOLES, FOR THAT PORTION OF A LAGGED TRENCH AGAINST WHICH CONCRETE IS POURED, NAMELY, AS A SUBSTITUTE FOR BACK FORMS (WHICH WORK IS PERFORMED BY PILEDRIVERS): $0.13 PER HOUR ADDITIONAL.....$ 52.24 26.18

CARP0213-002 07/01/2025

	Rates	Fringes
DIVER: (4) ASSISTANT TENDER AMOUNTS IN ""RATES' COLUMN ARE PER DAY	$ 418.96	26.18
DIVER: (3) TENDER AMOUNTS IN ""RATES' COLUMN ARE PER DAY	$ 442.96	26.18
DIVER: (2) STANDBY AMOUNTS IN ""RATES' COLUMN ARE PER DAY	$ 450.96	26.18
DIVER: (1) WET AMOUNTS IN ""RATES' COLUMN ARE PER DAY	$ 901.92	26.18

CARP0213-004 07/01/2025

	Rates	Fringes
DRYWALL (STOCKER/SCRAPPER)	$ 21.45	11.27
DRYWALL (DRYWALL INSTALLER/LATHER)	$ 52.24	26.18

CARP0721-001 07/01/2025

	Rates	Fringes
MODULAR FURNITURE INSTALLER	$ 25.00	13.06

ELEC0639-001 06/01/2025

	Rates	Fringes
ELECTRICIANS (WIREMAN/TECHNICIAN) FOOTNOTES: CABLE SPLICER: 10% ADDITIONAL PER HOUR ABOVE WIREMAN/TECHNICIAN BASIC HOURLY RATE. WORK FROM TRUSSES, SWINGING SCAFFOLDS, OPEN LADDERS,		

SCAFFOLDS, BOSUN CHAIRS, STACKS OR TOWERS, WHERE SUBJECT TO A DIRECT FALL FROM THE GROUND FLOOR OR SUPPORT STRUCTURE FROM A DISTANCE OF FIFTY (50) FEET TO NINETY (90) FEET: TO BE PAID TIME AND ONE-HALF. WORK FROM TRUSSES, SWINGING SCAFFOLDS, OPEN LADDERS, SCAFFOLDS, BOSUN CHAIRS, STACKS OR TOWERS, WHERE SUBJECT TO A DIRECT FALL FROM THE GROUND FLOOR OR SUPPORT STRUCTURE FROM A DISTANCE OVER NINETY (90) FEET: TO BE PAID DOUBLE THE REGULAR STRAIGHT TIME RATE OF PAY. WHERE WORKERS ARE REQUIRED TO WORK UNDER COMPRESSED AIR OR IN AREAS WHERE INJURIOUS GASES, DUST OR FUMES ARE PRESENT IN AMOUNTS NECESSITATING THE USE OF GAS MASKS OR SELF-CONTAINED BREATHING APPARATUS (PARTICLE MASKS ARE NOT CONSIDERED SELF-CONTAINED BREATHING APPARATUS) OR WHERE WORKERS WORK ON POLES AT A DISTANCE OF SEVENTY-FIVE (75) FEET OR MORE FROM THE GROUND: TO BE PAID A BONUS OF STRAIGHT TIME PAY. THIS SHALL BE AT A MINIMUM OF ONE HOUR, AND THEREAFTER, EACH SUCCEEDING HOUR OR FRACTION THEREOF SHALL CONSTITUTE AN HOUR AT THE BONUS RATE.
TUNNEL WORK: TO BE PAID AT THE TIME AND ONE-QUARTER HOURLY RATE. ALL EMPLOYERS MAY REQUEST WORKMEN TO REPORT DIRECT TO A JOB WITHIN A FREE ZONE TO INCLUDE EVERYTHING WEST OF TEN (10) MILES EAST OF HIGHWAY 101, AS THE CROW FLIES, AND THEN (10) MILES NORTH AND SOUTH OF HIGHWAY 46, AS THE CROW FLIES, TO THE JUNCTION OF HIGHWAY 41 AND HIGHWAY 46. EVERYTHING OUTSIDE THIS AREA SHALL BE PAID AT FULL SUBSISTENCE PROVIDE SAID JOB IS OF FIVE (5) DAYS DURATION OR MORE AND PROVIDE THERE IS STORAGE ON THE JOB FOR THE EMPLOYEE'S TOOLS. THE EMPLOYER WILL BE RESPONSIBLE FOR LOSS OF TOOLS UNDER SUCH CIRCUMSTANCES. (ROAD: THE MOST DIRECT ROUTE ON A SURFACED ROAD). ON ALL JOBS OR PROJECTS OUTSIDE THE FREE ZONE, AS STATED ABOVE, EMPLOYEES MAY BE REQUIRED TO REPORT TO THE JOB SITE IN THEIR OWN TRANSPORTATION AT THE REGULAR STARTING TIME AND REMAIN ON THE JOB SITE UNTIL THE REGULAR QUITTING TIME AND THESE SHALL BE PAID AT FIFTY DOLLARS ($50.00) PER DAY OR FIFTY-ONE CENTS ($0.51) PER MILE FOR EACH ROAD MILE FROM SHOP TO JOB AND JOB TO SHOP (ROUND TRIP). (DAY WORKED SHALL MEAN AT LEAST FOUR (4) HOURS ON THE JOB UNLESS SENT HOME ON ACCOUNT OF WEATHER, EMERGENCY, SICKNESS, OR INJURY). THE EMPLOYER SHALL PAY FOR TRAVELING TIME AND FURNISH TRANSPORTATION FROM SHOP TO JOB, JOB TO JOB, AND JOB TO SHOP. TRAVEL TIME SHALL BE AT THE APPROPRIATE RATE OF PAY FOR THAT DAY OF THE WEEK. (MONDAY THROUGH FRIDAY, STRAIGHT TIME, SATURDAY AND SUNDAY, DOUBLE TIME.).....$ 55.50 24.42

ELEC0639-003 06/30/2025

	Rates	Fringes
COMMUNICATIONS SYSTEM: INSTALLER SAN LUIS OBISPO COUNTY.....	$ 49.73	17.54

ELEC1245-001 01/01/2025

	Rates	Fringes
LINE CONSTRUCTION: (3) GROUNDMAN		

HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING,

CHRISTMAS DAY.....$ 40.76 21.76
LINE CONSTRUCTION: (2) EQUIPMENT SPECIALIST (OPERATES CRAWLER TRACTORS, COMMERCIAL MOTOR VEHICLES, BACKHOES, TRENCHERS, CRANES (50 TONS AND BELOW), OVERHEAD & UNDERGROUND DISTRIBUTION LINE EQUIPMENT) HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING, CHRISTMAS DAY.....$ 53.30 22.26
LINE CONSTRUCTION: (1) LINEMAN; CABLE SPLICER HOLIDAYS: NEW YEAR'S DAY, M.L. KING DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS DAY, THANKSGIVING DAY AND DAY AFTER THANKSGIVING, CHRISTMAS DAY.....$ 70.16 24.71

ELEV0008-003 01/01/2025

	Rates	Fringes
ELEVATOR MECHANIC FOOTNOTE: A. PAID VACATION: EMPLOYER CONTRIBUTES 8% OF REGULAR HOURLY RATE AS VACATION PAY CREDIT FOR EMPLOYEES WITH MORE THAN 5 YEARS OF SERVICE, AND 6% FOR 6 MONTHS TO 5 YEARS OF SERVICE. B. PAID HOLIDAYS: NEW YEAR'S DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, VETERANS' DAY, THANKSGIVING DAY, FRIDAY AFTER THANKSGIVING, AND CHRISTMAS DAY.....	$ 84.05	38.44

ENGI0012-004 08/01/2025

	Rates	Fringes
OPERATOR, POWER EQUIPMENT: (6) BARGE MATE (DREDGING).....	$ 61.34	40.95
OPERATOR, POWER EQUIPMENT: (5) FIREMAN-OILER, DECKHAND, BARGEMAN, LEVEEHAND (DREDGING).....	$ 60.73	40.95
OPERATOR, POWER EQUIPMENT: (4) WINCH OPERATOR (STERN WINCH ON DREDGE) (DREDGING).....	$ 61.27	40.95
OPERATOR, POWER EQUIPMENT: (3) DECKMATE (DREDGING)..	$ 61.82	40.95
OPERATOR, POWER EQUIPMENT: (2) DREDGE DOZER (DREDGING).....	$ 61.93	40.95
OPERATOR, POWER EQUIPMENT: (1) LEVERMAN (DREDGING)..	$ 67.90	40.95

ENGI0012-024 07/01/2025

	Rates	Fringes
OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 7- Tunnel mole boring machine operator PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....	$ 66.91	33.20
OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 6- Heavy Duty Repairman PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton		

Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....$ 66.79 33.20

OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 5- Backhoe operator (up to and including 3/4 yd.); Small Ford, Case or similar; Drill doctor; Grouting machine operator; Heading shield operator; Heavy-duty repairperson; Loader operator (Athey, Euclid, Sierra and similar types); Mucking machine operator (1/4 yd., rubber-tired, rail or track type); Pneumatic concrete placing machine operator (Hackley-Presswell or similar type); Pneumatic heading shield (tunnel); Pumpcrete gun operator; Tractor compressor drill combination operator; Tugger hoist operator (2 drum); Tunnel locomotive operator (over 30 tons) PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....$ 66.68 33.20

OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 4- Bit sharpener; Equipment greaser (grease truck); Slip form pump operator (power-driven hydraulic lifting device for concrete forms); Tugger hoist operator (1 drum); Tunnel locomotive operator (over 10 and up to and including 30 tons) PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....$ 66.46 33.20

OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 3- Dinkey locomotive or motorperson (up to and including 10 tons) PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....$ 66.32 33.20

OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 2- Power-driven jumbo form setter operator PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB,

Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....$ 66.03 33.20

OPERATOR: POWER EQUIPMENT, TUNNEL WORK: GROUP 1- Skiploader (wheel type up to 3/4 yd. without attachment) PREMIUM PAY: $10.00 per hour shall be paid on all Power Equipment Operator work on the followng Military Bases: China Lake Naval Reserve, Vandenberg AFB, Point Arguello, Seely Naval Base, Fort Irwin, Nebo Annex Marine Base, Marine Corp Logistics Base Yermo, Edwards AFB, 29 Palms Marine Base and Camp Pendleton Workers required to suit up and work in a hazardous material environment: $2.00 per hour additional. Combination mixer and compressor operator on gunite work shall be classified as a concrete mobile mixer operator.....$ 65.25 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 13 Crane operator (over 300 tons); Derrick barge operator (over 300 tons); Helicopter pilot; Hoist operator, stiff legs, Guy derrick or similar type (over 300 tons); Mobile tower crane operator (over 300 tons).....$ 70.75 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 12- Crane operator (over 200 tons up to and including 300 tons mrc); Derrick barge operator (over 200 tons up to and including 300 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 200 tons, up to and including 300 tons mrc); Mobile tower crane operator (over 200 tons, up to and including 300 tons mrc) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 69.75 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 11- Crane operator (over 100 tons and up to and including 200 tons mrc); Derrick barge operator (over 100 tons up to and including 200 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 100 tons up to and including 200 tons mrc); Mobile tower crane operator (over 100 tons up to and including 200 tons mrc) ; Tower crane operator and tower gantry PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE

CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 68.75 33.20
OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 10- Crane operator (over 50 tons and up to and including 100 tons mrc); Derrick barge operator (over 50 tons up to and including 100 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 50 tons up to and including 100 tons mrc), Mobile tower crane operator (over 50 tons, up to and including 100 tons M.R.C.) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE
CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.75 33.20
OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 9 Crane operator (over 25 tons and up to and including 50 tons mrc); Derrick barge operator (over 25 tons up to and including 50 tons mrc); Highline cableway operator; Hoist operator, stiff legs, Guy derrick or similar type (over 25 tons up to and including 50 tons mrc); K-crane operator; Polar crane operator; Self erecting tower crane operator maximum lifting capacity ten tons PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE
CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.75 33.20
OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 8 Crane operator (up to and including 25 ton capacity); Crawler transporter operator; Derrick barge operator (up to and including 25 ton capacity); Hoist operator, stiff legs, Guy derrick or similar type (up to and including 25 ton capacity); Shovel, backhoe, dragline, clamshell operator (over 7 cu. yds., M.R.C.) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE
CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.58 33.20
OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 7 PEDESTAL CRANE OPERATOR; SHOVEL, BACKHOE, DRAGLINE, CLAMSHELL OPERATOR (OVER 5 CU. YDS. MRC); TOWER CRANE REPAIR; TUGGER HOIST OPERATOR (3 DRUM) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK

ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.41 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 6 Bridge crane operator; Cretor crane operator; Hoist operator (Chicago boom and similar type); Lift mobile operator; Lift slab machine operator (Vagtborg and similar types); Material hoist and/or manlift operator; Polar gantry crane operator; Self Climbing scaffold (or similar type); Shovel, backhoe, dragline, clamshell operator (over 3/4 yd. and up to 5 cu. yds. mrc); Tugger hoist operator PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.29 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 5 HYDRAULIC BOOM TRUCK; STINGER CRANE (AUSTIN-WESTERN OR SIMILAR TYPE); TUGGER HOIST OPERATOR (1 DRUM) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.18 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 4- Bridge-type unloader and turntable operator; Helicopter hoist operator PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 65.96 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 3- A-frame or winch truck operator; Ross carrier operator (jobsite) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG

MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 65.82 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 2- Truck crane oiler PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 65.53 33.20

OPERATOR: POWER EQUIPMENT, CRANES, PILEDRIVING & HOISTING: GROUP 1- Engineer oiler; Fork lift operator (includes loed, lull or similar types) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.
.....$ 64.75 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 25- CONCRETE PUMP OPERATOR-TRUCK MOUNTED; RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH THE TANDEM PUSH-PULL SYSTEM (MULTIPLE ENGINE, EUCLID, CATERPILLAR AND SIMILAR TYPE, OVER 50 CU. YDS. STRUCK); SPYDER EXCAVATOR OPERATOR, WITH ALL ATTACHMENTS PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR. $ 68.08 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 24- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH THE TANDEM PUSH-PULL SYSTEM (SINGLE ENGINE, OVER 50 YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH THE TANDEM PUSH-PULL SYSTEM (MULTIPLE ENGINE, EUCLID, CATERPILLAR AND SIMILAR, OVER 25 YDS. AND UP TO 50 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG

MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.91 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 23- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH THE TANDEM PUSH-PULL SYSTEM (SINGLE ENGINE, CATERPILLAR, EUCLID, ATHEY WAGON AND SIMILAR TYPES WITH ANY AND ALL ATTACHMENTS OVER 25 YDS. AND UP TO AND INCLUDING 50 YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING WITH THE TANDEM PUSH-PULL SYSTEM (MULTIPLE ENGINE, UP TO AND INCLUDING 25 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.79 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 22- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH THE TANDEM PUSH-PULL SYSTEM (SINGLE ENGINE, UP TO AND INCLUDING 25 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.68 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 21- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING IN TANDEM (SCRAPERS, BELLY DUMPS AND SIMILAR TYPES IN ANY COMBINATION, EXCLUDING COMPACTION UNITS - MULTIPLE ENGINE, EUCLID, CATERPILLAR AND SIMILAR TYPE, OVER 50 CU. YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.58 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 2-0 RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING IN TANDEM (SCRAPERS, BELLY DUMPS AND SIMILAR TYPES IN ANY COMBINATION, EXCLUDING

COMPACTION UNITS - SINGLE ENGINE, OVER 50 YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING IN TANDEM (SCRAPERS, BELLY DUMPS, AND SIMILAR TYPES IN ANY COMBINATION, EXCLUDING COMPACTION UNITS - MULTIPLE ENGINE, EUCLID, CATERPILLAR AND SIMILAR, OVER 25 YDS. AND UP TO 50 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.41 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 19- ROTEX CONCRETE BELT OPERATOR (OR SIMILAR TYPES); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING IN TANDEM (SCRAPERS, BELLY DUMPS AND SIMILAR TYPES IN ANY COMBINATION, EXCLUDING COMPACTION UNITS - SINGLE ENGINE, CATERPILLAR, EUCLID, ATHEY WAGON AND SIMILAR TYPES WITH ANY AND ALL ATTACHMENTS OVER 25 YDS.AND UP TO AND INCLUDING 50 CU. YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING IN TANDEM (SCRAPERS, BELLY DUMPS AND SIMILAR TYPES IN ANY COMBINATION, EXCLUDING COMPACTION UNITS - MULTIPLE ENGINE, UP TO AND INCLUDING 25 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.29 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 18- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING IN TANDEM (SCRAPERS, BELLY DUMPS AND SIMILAR TYPES IN ANY COMBINATION, EXCLUDING COMPACTION UNITS - SINGLE ENGINE, UP TO AND INCLUDING 25 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.18 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 17- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH PUSH-PULL SYSTEM (MULTIPLE ENGINE, EUCLID, CATERPILLAR AND SIMILAR, OVER 50 CU. YDS. STRUCK); TANDEM TRACTOR OPERATOR (OPERATING CRAWLER TYPE TRACTORS IN TANDEM - QUAD 9

AND SIMILAR TYPE) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 67.08 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 16- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH PUSH-PULL SYSTEM (SINGLE ENGINE, OVER 50 YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH PUSH-PULL SYSTEM (MULTIPLE ENGINE, EUCLID, CATERPILLAR AND SIMILAR, OVER 25 YDS. AND UP TO 50 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.91 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 15- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH PUSH-PULL SYSTEM (SINGLE ENGINE, CATERPILLAR, EUCLID, ATHEY WAGON AND SIMILAR TYPES WITH ANY AND ALL ATTACHMENTS OVER 25 YDS. AND UP TO AND INCLUDING 50 YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR, OPERATING EQUIPMENT WITH PUSH-PULL SYSTEM (MULTIPLE ENGINE-UP TO AND INCLUDING 25 YDS. STRUCK) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.79 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 14- CANAL LINER OPERATOR; CANAL TRIMMER OPERATOR; REMOTE- CONTROL EARTH-MOVING EQUIPMENT OPERATOR (OPERATING A SECOND PIECE OF EQUIPMENT: $1.00 PER HOUR ADDITIONAL); WHEEL EXCAVATOR OPERATOR (OVER 750 CU. YDS.) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND

COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE
CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.71 33.20
OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP
13- RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR
OPERATING EQUIPMENT WITH PUSH-PULL SYSTEM (SINGLE
ENGINE, UP TO AND INCLUDING 25 YDS. STRUCK)
PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL
POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG
MILITARY BASES: CHINA LAKE NAVAL RESERVE,
VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE,
FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP
LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE
BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT
UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT:
$2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND
COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE
CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.68 33.20
OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP
12- AUTO GRADER OPERATOR; AUTOMATIC SLIP FORM
OPERATOR; DRILLING MACHINE OPERATOR, BUCKET OR
AUGER TYPES (CALWELD, AUGER 200 CA OR SIMILAR TYPES
- WATSON, AUGER 6000 OR SIMILAR TYPES - HUGHES
SUPER DUTY, AUGER 200 OR SIMILAR TYPES - DRILLING
DEPTH OF 175' MAXIMUM); HOE RAM OR SIMILAR WITH
COMPRESSOR; MASS EXCAVATOR OPERATOR LESS THA 750
CU. YARDS; MECHANICAL FINISHING MACHINE OPERATOR;
MOBILE FORM TRAVELER OPERATOR; MOTOR PATROL
OPERATOR (MULTI-ENGINE); PIPE MOBILE MACHINE
OPERATOR; RUBBER-TIRED EARTH- MOVING EQUIPMENT
OPERATOR (MULTIPLE ENGINE, EUCLID, CATERPILLAR AND
SIMILAR TYPE, OVER 50 CU. YDS. STRUCK);
RUBBER-TIRED SELF- LOADING SCRAPER OPERATOR
(PADDLE-WHEEL-AUGER TYPE SELF-LOADING - TWO (2) OR
MORE UNITS) PREMIUM PAY: $10.00 PER HOUR SHALL BE
PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE
FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE,
VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE,
FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP
LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE
BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT
UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT:
$2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND
COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE
CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.58 33.20
OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP
10- DRILLING MACHINE OPERATOR, BUCKET OR AUGER
TYPES (CALWELD 200 B BUCKET OR SIMILAR TYPES-WATSON
3000 OR 5000 AUGER OR SIMILAR TYPES-TEXOMA 900
AUGER OR SIMILAR TYPES-DRILLING DEPTH OF 105'
MAXIMUM); DUAL DRUM MIXER, DYNAMIC COMPACTOR LDC350
(OR SIMILAR TYPES); MONORAIL LOCOMOTIVE OPERATOR
(DIESEL, GAS OR ELECTRIC); MOTOR PATROL-BLADE
OPERATOR (SINGLE ENGINE); MULTIPLE ENGINE TRACTOR
OPERATOR (EUCLID AND SIMILAR TYPE-EXCEPT QUAD 9
CAT.); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR
(SINGLE ENGINE, OVER 50 YDS. STRUCK); PNEUMATIC
PIPE RAMMING TOOL AND SIMILAR TYPES; PRESTRESSED
WRAPPING MACHINE OPERATOR; RUBBER-TIRED
EARTH-MOVING EQUIPMENT OPERATOR (SINGLE ENGINE,
OVER 50 YDS. STRUCK); RUBBER TIRED EARTH MOVING
EQUIPMENT OPERATOR (MULTIPLE ENGINE, EUCLID,
CATERPILLAR AND SIMILAR OVER 25 YDS. AND UP TO 50
YDS. STRUCK), TOWER CRANE REPAIRMAN; TRACTOR LOADER
OPERATOR (CRAWLER AND WHEEL TYPE OVER 6-1/2 YDS.);
WOODS MIXER OPERATOR (AND SIMILAR PUGMILL

EQUIPMENT) PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.41 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 8- ASPHALT OR CONCRETE SPREADING OPERATOR (TAMPING OR FINISHING); ASPHALT PAVING MACHINE OPERATOR (BARBER GREENE OR SIMILAR TYPE); ASPHALT-RUBBER DISTRIBUTION OPERATOR; BACKHOE OPERATOR (UP TO AND INCLUDING 3/4 YD.), SMALL FORD, CASE OR SIMILAR TYPES; CABLE BUNDLING MACHINE OPERATOR (EXCLUDING HANDHELD); CABLE TRENCHING MACHINE OPERATOR (SPIDER PLOW OR SIMILAR TYPES) CAST-IN-PLACE PIPE LAYING MACHINE OPERATOR; COMBINATION MIXER AND COMPRESSOR OPERATOR (GUNITE WORK); COMPACTOR OPERATOR (SELF-PROPELLED); CONCRETE MIXER OPERATOR (PAVING); CRUSHING PLANT OPERATOR; DRILL DOCTOR; DRILLING MACHINE OPERATOR, BUCKET OR AUGER TYPES (CALWELD 150 BUCKET OR SIMILAR TYPES - WATSON 1500, 2000 2500 AUGER OR SIMILAR TYPES - TEXOMA 700, 800 AUGER OR SIMILAR TYPES - DRILLING DEPTH OF 60' MAXIMUM); ELEVATING GRADER OPERATOR; GRADE CHECKER; GRADALL OPERATOR; GROUTING MACHINE OPERATOR; HEAVY-DUTY REPAIRMAN; HEAVY EQUIPMENT ROBOTICS OPERATOR; KALAMAZOO BALLISTE REGULATOR OR SIMILAR TYPE; KOLMAN BELT LOADER AND SIMILAR TYPE; LE TOURNEAU BLOB COMPACTOR OR SIMILAR TYPE; LOADER OPERATOR (ATHEY, EUCLID, SIERRA AND SIMILAR TYPES); MOBARK CHIPPER OR SIMILAR; OZZIE PADDER OR SIMILAR TYPES; P.C. SLOT SAW; PNEUMATIC CONCRETE PLACING MACHINE OPERATOR (HACKLEY-PRESSWELL OR SIMILAR TYPE); PUMPCRETE GUN OPERATOR; RCM CEMENTING UNIT OPERATOR, RAIL/SWITCH GRINDER OPERATOR (HARSCO OR SIMILAR TYPES) ROCK DRILL OR SIMILAR TYPES; ROTARY DRILL OPERATOR (EXCLUDING CAISSON TYPE); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR (SINGLE ENGINE, CATERPILLAR, EUCLID, ATHEY WAGON AND SIMILAR TYPES WITH ANY AND ALL ATTACHMENTS OVER 25 YDS. UP TO AND INCLUDING 50 CU. YDS. STRUCK); RUBBER-TIRED EARTH-MOVING EQUIPMENT OPERATOR (MULTIPLE ENGINE UP TO AND INCLUDING 25 YDS. STRUCK); RUBBER-TIRED SCRAPER OPERATOR (SELF-LOADING PADDLE WHEEL TYPE-JOHN DEERE, 1040 AND SIMILAR SINGLE UNIT); SELF- PROPELLED CURB AND GUTTER MACHINE OPERATOR; SHUTTLE BUGGY; SKIPLOADER OPERATOR (CRAWLER AND WHEEL TYPE OVER 1-1/2 YDS. UP TO AND INCLUDING 6-1/2 YDS.); SOIL REMEDIATION PLANT OPERATOR; SURFACE HEATERS AND PLANER OPERATOR; TRACTOR COMPRESSOR DRILL COMBINATION OPERATOR; TRACTOR OPERATOR (ANY TYPE LARGER THAN D-5 - 100 FLYWHEEL H.P. AND OVER, OR SIMILAR-BULLDOZER, TAMPER, SCRAPER AND PUSH TRACTOR SINGLE ENGINE); TRACTOR OPERATOR (BOOM ATTACHMENTS), TRAVELING PIPE WRAPPING, CLEANING AND BENDNG MACHINE OPERATOR; TRENCHING MACHINE OPERATOR (OVER 6 FT. DEPTH CAPACITY, MANUFACTURER'S RATING); TRENCHING MACHINE WITH ROAD MINER ATTACHMENT (OVER 6 FT DEPTH CAPACITY): ULTRA HIGH PRESSURE WATERJET

CUTTING TOOL SYSTEM MECHANIC; WATER PULL (COMPACTION) OPERATOR PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.29 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 6- ARTICULATING MATERIAL HAULER; ASPHALT PLANT ENGINEER; BATCH PLANT OPERATOR; BIT SHARPENER; CONCRETE JOINT MACHINE OPERATOR (CANAL AND SIMILAR TYPE); CONCRETE PLANER OPERATOR; DANDY DIGGER; DECK ENGINE OPERATOR; DERRICKMAN (OILFIELD TYPE); DRILLING MACHINE OPERATOR, BUCKET OR AUGER TYPES (CALWELD 100 BUCKET OR SIMILAR TYPES - WATSON 1000 AUGER OR SIMILAR TYPES - TEXOMA 330, 500 OR 600 AUGER OR SIMILAR TYPES - DRILLING DEPTH OF 45' MAXIMUM); DRILLING MACHINE OPERATOR; HYDROGRAPHIC SEEDER MACHINE OPERATOR (STRAW, PULP OR SEED), JACKSON TRACK MAINTAINER, OR SIMILAR TYPE; KALAMAZOO SWITCH TAMPER, OR SIMILAR TYPE; MACHINE TOOL OPERATOR; MAGINNIS INTERNAL FULL SLAB VIBRATOR, MECHANICAL BERM, CURB OR GUTTER(CONCRETE OR ASPHALT); MECHANICAL FINISHER OPERATOR (CONCRETE, CLARY-JOHNSON-BIDWELL OR SIMILAR); MICRO TUNNEL SYSTEM (BELOW GROUND); PAVEMENT BREAKER OPERATOR (TRUCK MOUNTED); ROAD OIL MIXING MACHINE OPERATOR; ROLLER OPERATOR (ASPHALT OR FINISH), RUBBER-TIRED EARTH MOVING EQUIPMENT (SINGLE ENGINE, UP TO AND INCLUDING 25 YDS. STRUCK); SELF-PROPELLED TAR PIPELINING MACHINE OPERATOR; SKIPLOADER OPERATOR (CRAWLER AND WHEEL TYPE, OVER 3/4 YD. AND UP TO AND INCLUDING 1-1/2 YDS.); SLIP FORM PUMP OPERATOR (POWER DRIVEN HYDRAULIC LIFTING DEVICE FOR CONCRETE FORMS); TRACTOR OPERATOR-BULLDOZER, TAMPER-SCRAPER (SINGLE ENGINE, UP TO 100 H.P. FLYWHEEL AND SIMILAR TYPES, UP TO AND INCLUDING D-5 AND SIMILAR TYPES); TUGGER HOIST OPERATOR (1 DRUM); ULTRA HIGH PRESSURE WATERJET CUTTING TOOL SYSTEM OPERATOR; VACUUM BLASTING MACHINE OPERATOR PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 66.18 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 4- ASPHALT PLANT FIREMAN; BACKHOE OPERATOR (MINI-MAX OR SIMILAR TYPE); BORING MACHINE OPERATOR; BOXMAN OR MIXERMAN (ASPHALT OR CONCRETE); CHIP SPREADING MACHINE OPERATOR; CONCRETE CLEANING DECONTAMINATION MACHINE OPERATOR; CONCRETE PUMP OPERATOR (SMALL PORTABLE);DIRECT PUSH OPERATOR (GEOPROBE OR SIMILAR TYPES) DRILLING MACHINE

OPERATOR, SMALL AUGER TYPES (TEXOMA SUPER ECONOMATIC OR SIMILAR TYPES - HUGHES 100 OR 200 OR SIMILAR TYPES - DRILLING DEPTH OF 30' MAXIMUM); EQUIPMENT GREASER (GREASE TRUCK); GUARD RAIL POST DRIVER OPERATOR; HIGHLINE CABLEWAY SIGNALMAN; HYDRA-HAMMER-AERO STOMPER; MICRO TUNNELING (ABOVE GROUND TUNNEL); POWER CONCRETE CURING MACHINE OPERATOR; POWER CONCRETE SAW OPERATOR; POWER-DRIVEN JUMBO FORM SETTER OPERATOR; POWER SWEEPER OPERATOR; ROCK WHEEL SAW/TRENCHER; ROLLER OPERATOR (COMPACTING); SCREED OPERATOR (ASPHALT OR CONCRETE); TRENCHING MACHINE OPERATOR (UP TO 6 FT.); VACUUM OR MUCH TRUCK PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 65.96 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 3- ASPHALT-RUBBER BLEND OPERATOR; BOBCAT OR SIMILAR TYPE (SKID STEER); EQUIPMENT GREASER (RACK); FORD FERGUSON (WITH DRAGTYPE ATTACHMENTS); HELICOPTER RADIOMAN (GROUND); STATIONARY PIPE WRAPPING AND CLEANING MACHINE OPERATOR PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 64.67 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP 2- ASPHALT-RUBBER PLANT OPERATOR (NURSE TANK OPERATOR);COIL TUBING RIG OPERATOR, CONCRETE MIXER OPERATOR-SKIP TYPE; CONVEYOR OPERATOR; FIREMAN; FORKLIFT OPERATOR (INCLUDES LOED, LULL OR SIMILAR TYPES OVER 5 TONS; HYDROSTATIC PUMP OPERATOR; OILER CRUSHER (ASPHALT OR CONCRETE PLANT); PETROMAT LAYDOWN MACHINE; PJU SIDE DUM JACK; SCREENING AND CONVEYOR MACHINE OPERATOR (OR SIMILAR TYPES); SKIPLOADER (WHEEL TYPE UP TO 3/4 YD. WITHOUT ATTACHMENT); TAR POT FIREMAN; TEMPORARY HEATING PLANT OPERATOR; TRENCHING MACHINE OILER PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 64.18 33.20

OPERATOR: POWER EQUIPMENT, ALL OTHER WORK: GROUP

1- BARGEMAN; BRAKEMAN; COMPRESSOR OPERATOR; DITCH WITCH, WITH SEAT OR SIMILAR TYPE EQUIPMENT; ELEVATOR OPERATOR-INSIDE; ENGINEER OILER; FORKLIFT OPERATOR (INCLUDES LOED, LULL OR SIMILAR TYPES UNDER 5 TONS; GENERATOR OPERATOR; GENERATOR, PUMP OR COMPRESSOR PLANT OPERATOR; PUMP OPERATOR; SIGNALMAN; SWITCHMAN PREMIUM PAY: $10.00 PER HOUR SHALL BE PAID ON ALL POWER EQUIPMENT OPERATOR WORK ON THE FOLLOWNG MILITARY BASES: CHINA LAKE NAVAL RESERVE, VANDENBERG AFB, POINT ARGUELLO, SEELY NAVAL BASE, FORT IRWIN, NEBO ANNEX MARINE BASE, MARINE CORP LOGISTICS BASE YERMO, EDWARDS AFB, 29 PALMS MARINE BASE AND CAMP PENDLETON WORKERS REQUIRED TO SUIT UP AND WORK IN A HAZARDOUS MATERIAL ENVIRONMENT: $2.00 PER HOUR ADDITIONAL. COMBINATION MIXER AND COMPRESSOR OPERATOR ON GUNITE WORK SHALL BE CLASSIFIED AS A CONCRETE MOBILE MIXER OPERATOR.....$ 63.40 33.20

IRON0433-006 01/01/2025

	Rates	Fringes
IRONWORKER (ORNAMENTAL, REINFORCING AND STRUCTURAL)	$ 50.70	35.15
IRONWORKER (FENCE ERECTOR)	$ 45.78	26.51

LABO0220-001 07/01/2025

	Rates	Fringes
LABORER, TUNNEL: GROUP 3 BLASTER, DRILLER, POWDER PERSON; CHEMICAL GROUT JET PERSON; CHERRY PICKER PERSON; GROUT GUN PERSON; GROUT MIXER PERSON; GROUT PUMP PERSON; JACKLEG MINER; JUMBO PERSON; KEMPER AND OTHER PNEUMATIC CONCRETE PLACER OPERATOR; MINER, TUNNEL (HAND OR MACHINE); NOZZLE PERSON; OPERATING OF TROWELING AND/OR GROUTING MACHINES; POWDER PERSON (PRIMER HOUSE); PRIMER PERSON; SANDBLASTER; SHOTCRETE PERSON; STEEL FORM RAISER AND SETTER; TIMBER PERSON, RETIMBER PERSON, WOOD OR STEEL; TUNNEL CONCRETE FINISHER	$ 54.38	25.74
LABORER, TUNNEL: GROUP 2 BULL GANG MUCKER, TRACK PERSON; CHUCKTENDER, CABLETENDER; CONCRETE CREW, INCLUDING RODDER AND SPREADER; LOADING AND UNLOADING AGITATOR CARS; VIBRATOR PERSON, JACK HAMMER, PNEUMATIC TOOLS (EXCEPT DRILLER)	$ 53.92	25.74
LABORER, TUNNEL: GROUP 1: BATCH PLANT LABORER; CHANGEHOUSE PERSON; DUMP PERSON; DUMP PERSON (OUTSIDE); SWAMPER (BRAKE PERSON AND SWITCH PERSON ON TUNNEL WORK); TUNNEL MATERIALS HANDLING PERSON; NIPPER; POT TENDER, USING MASTIC OR OTHER MATERIALS (FOR EXAMPLE, BUT NOT BY WAY OF LIMITATION, SHOTCRETE, ETC.);	$ 53.60	25.74
LABORER, TUNNEL: GROUP 4: DIAMOND DRILLER; SANDBLASTER; SHAFT AND RAISE WORK	$ 55.07	25.74
LABORER GROUP 5: BLASTER POWDER, ALL WORK OF LOADING HOLES, PLACING AND BLASTING OF ALL POWDER AND EXPLOSIVES OF WHATEVER TYPE, REGARDLESS OF METHOD USED FOR SUCH LOADING AND PLACING; DRILLER: ALL POWER DRILLS, EXCLUDING JACKHAMMER, WHETHER CORE, DIAMOND, WAGON, TRACK, MULTIPLE UNIT, AND ANY AND ALL OTHER TYPES OF MECHANICAL DRILLS WITHOUT REGARD TO THE FORM OF MOTIVE POWER; TOXIC WASTE REMOVAL TUNNEL LABORER CLASSIFICATIONS	$ 49.48	25.95
LABORER GROUP 4: ASPHALT RAKER, LUTE PERSON, IRONER, ASPHALT DUMP PERSON, AND ASPHALT SPREADER		

BOXES (ALL TYPES); CONCRETE CORE CUTTER (WALLS, FLOORS OR CEILINGS), GRINDER OR SANDER; CONCRETE SAW PERSON, CUTTING WALLS OR FLAT WORK, SCORING OLD OR NEW CONCRETE; CRIBBER, SHORER, LAGGING, SHEETING AND TRENCH BRACING, HAND-GUIDED LAGGING HAMMER; HEAD ROCK SLINGER; LABORER, ASPHALT- RUBBER DISTRIBUTOR BOOT PERSON; LASER BEAM IN CONNECTION WITH LABORERS' WORK; OVERSIZE CONCRETE VIBRATOR OPERATOR, 70 LBS. AND OVER; PIPELAYER PERFORMING ALL SERVICES IN THE LAYING AND INSTALLATION OF PIPE FROM THE POINT OF RECEIVING PIPE IN THE DITCH UNTIL COMPLETION OF OPERATION, INCLUDING ANY AND ALL FORMS OF TUBULAR MATERIAL, WHETHER PIPE, METALLIC OR NON-METALLIC, CONDUIT AND ANY OTHER STATIONARY TYPE OF TUBULAR DEVICE USED FOR THE CONVEYING OF ANY SUBSTANCE OR ELEMENT, WHETHER WATER, SEWAGE, SOLID GAS, AIR, OR OTHER PRODUCT WHATSOEVER AND WITHOUT REGARD TO THE NATURE OF MATERIAL FROM WHICH THE TUBULAR MATERIAL IS FABRICATED; NO-JOINT PIPE AND STRIPPING OF SAME; PREFABRICATED MANHOLE INSTALLER; SANDBLASTER (NOZZLE PERSON), WATER BLASTING, PORTA SHOT-BLAST.....$ 49.13 25.95

LABORER GROUP 3: BUGGYMOBILE PERSON; CONCRETE CUTTING TORCH; CONCRETE PILE CUTTER; DRILLER, JACKHAMMER, 2-1/2 FT. DRILL STEEL OR LONGER; DRI-PAK-IT MACHINE; GAS, OIL AND/OR WATER PIPELINE WRAPPER, 6-IN. PIPE AND OVER, BY ANY METHOD, INSIDE AND OUT; HIGH SCALER (INCLUDING DRILLING OF SAME); HYDRO SEEDER AND SIMILAR TYPE; IMPACT WRENCH MULTI-PLATE; KETTLE PERSON, POT PERSON AND WORKERS APPLYING ASPHALT, LAY-KOLD, CREOSOTE, LIME CAUSTIC AND SIMILAR TYPE MATERIALS (""APPLYING"" MEANS APPLYING, DIPPING, BRUSHING OR HANDLING OF SUCH MATERIALS FOR PIPE WRAPPING AND WATERPROOFING); OPERATOR OF PNEUMATIC, GAS, ELECTRIC TOOLS, VIBRATING MACHINE, PAVEMENT BREAKER, AIR BLASTING, COME-ALONGS, AND SIMILAR MECHANICAL TOOLS NOT SEPARATELY CLASSIFIED HEREIN; PIPELAYER'S BACKUP PERSON, COATING, GROUTING, MAKING OF JOINTS, SEALING, CAULKING, DIAPERING AND INCLUDING RUBBER GASKET JOINTS, POINTING AND ANY AND ALL OTHER SERVICES; ROCK SLINGER; ROTARY SCARIFIER OR MULTIPLE HEAD CONCRETE CHIPPING SCARIFIER; STEEL HEADERBOARD AND GUIDELINE SETTER; TAMPER, BARKO, WACKER AND SIMILAR TYPE; TRENCHING MACHINE, HAND-PROPELLED.....$ 47.58 25.95

LABORER GROUP 2: ASPHALT SHOVELER; CEMENT DUMPER (ON 1 YD. OR LARGER MIXER AND HANDLING BULK CEMENT); CESSPOOL DIGGER AND INSTALLER; CHUCKTENDER; CHUTE HANDLER, POURING CONCRETE, THE HANDLING OF THE CHUTE FROM READYMIX TRUCKS, SUCH AS WALLS, SLABS, DECKS, FLOORS, FOUNDATION, FOOTINGS, CURBS, GUTTERS AND SIDEWALKS; CONCRETE CURER, IMPERVIOUS MEMBRANE AND FORM OILER; CUTTING TORCH OPERATOR (DEMOLITION); FINE GRADER, HIGHWAYS AND STREET PAVING, AIRPORT, RUNWAYS AND SIMILAR TYPE HEAVY CONSTRUCTION; GAS, OIL AND/OR WATER PIPELINE WRAPPER - POT TENDER AND FORM PERSON; GUINEA CHASER; HEADERBOARD PERSON - ASPHALT; LABORER, PACKING ROD STEEL AND PANS; MEMBRANE VAPOR BARRIER INSTALLER; POWER BROOM SWEEPER (SMALL); RIPRAP STONEPAVER, PLACING STONE OR WET SACKED CONCRETE; ROTO SCRAPER AND TILLER; SANDBLASTER (POT TENDER); SEPTIC TANK DIGGER AND INSTALLER(LEAD); TANK SCALER AND CLEANER; TREE CLIMBER, FALLER, CHAIN SAW

OPERATOR, PITTSBURGH CHIPPER AND SIMILAR TYPE BRUSH SHREDDER; UNDERGROUND LABORER, INCLUDING CAISSON BELLOWER.....$ 47.03 25.95

LABORER GROUP 1: CLEANING AND HANDLING OF PANEL FORMS; CONCRETE SCREEDING FOR ROUGH STRIKE-OFF; CONCRETE, WATER CURING; DEMOLITION LABORER, THE CLEANING OF BRICK IF PERFORMED BY A WORKER PERFORMING ANY OTHER PHASE OF DEMOLITION WORK, AND THE CLEANING OF LUMBER; FIRE WATCHER, LIMBER, BRUSH LOADER, PILER AND DEBRIS HANDLER; FLAG PERSON; GAS, OIL AND/OR WATER PIPELINE LABORER; LABORER, ASPHALT-RUBBER MATERIAL LOADER; LABORER, GENERAL OR CONSTRUCTION; LABORER, GENERAL CLEAN-UP; LABORER, LANDSCAPING; LABORER, JETTING; LABORER, TEMPORARY WATER AND AIR LINES; MATERIAL HOSE OPERATOR (WALLS, SLABS, FLOORS AND DECKS); PLUGGING, FILLING OF SHEE BOLT HOLES; DRY PACKING OF CONCRETE; RAILROAD MAINTENANCE, REPAIR TRACK PERSON AND ROAD BEDS; STREETCAR AND RAILROAD CONSTRUCTION TRACK LABORERS; RIGGING AND SIGNALING; SCALER; SLIP FORM RAISER; TAR AND MORTAR; TOOL CRIB OR TOOL HOUSE LABORER; TRAFFIC CONTROL BY ANY METHOD; WINDOW CLEANER; WIRE MESH PULLING - ALL CONCRETE POURING OPERATIONS......$ 46.48 25.95

LABO0220-004 11/01/2025

	Rates	Fringes
BRICK TENDER	$ 42.60	22.13

LABO0300-005 07/01/2025

	Rates	Fringes
ASBESTOS REMOVAL LABORER SCOPE OF WORK: INCLUDES SITE MOBILIZATION, INITIAL SITE CLEANUP, SITE PREPARATION, REMOVAL OF ASBESTOS-CONTAINING MATERIAL AND TOXIC WASTE, ENCAPSULATION, ENCLOSURE AND DISPOSAL OF ASBESTOS- CONTAINING MATERIALS AND TOXIC WASTE BY HAND OR WITH EQUIPMENT OR MACHINERY; SCAFFOLDING, FABRICATION OF TEMPORARY WOODEN BARRIERS AND ASSEMBLY OF DECONTAMINATION STATIONS...	$ 46.48	25.93

LABO0345-001 07/01/2025

	Rates	Fringes
LABORER, GUNITE: GROUP 3 REBOUNDMEN FOOTNOTE: GUNITE PREMIUM PAY: WORKERS WORKING FROM A BOSN'N'S CHAIR OR SUSPENDED FROM A ROPE OR CABLE SHALL RECEIVE 40 CENTS PER HOUR ABOVE THE FOREGOING APPLICABLE CLASSIFICATION RATES. WORKERS DOING GUNITE AND/OR SHOTCRETE WORK IN A TUNNEL SHALL RECEIVE 35 CENTS PER HOUR ABOVE THE FOREGOING APPLICABLE CLASSIFICATION RATES, PAID ON A PORTAL-TO-PORTAL BASIS. ANY WORK PERFORMED ON, IN OR ABOVE ANY SMOKE STACK, SILO, STORAGE ELEVATOR OR SIMILAR TYPE OF STRUCTURE, WHEN SUCH STRUCTURE IS IN EXCESS OF 75'-0"" ABOVE BASE LEVEL AND WHICH WORK MUST BE PERFORMED IN WHOLE OR IN PART MORE THAN 75'-0"" ABOVE BASE LEVEL, THAT WORK PERFORMED ABOVE THE 75'-0"" LEVEL SHALL BE COMPENSATED FOR AT 35 CENTS PER HOUR ABOVE THE APPLICABLE CLASSIFICATION WAGE RATE	$ 51.39	23.77

LABORER, GUNITE: GROUP 2 GUNMEN FOOTNOTE: GUNITE PREMIUM PAY: WORKERS WORKING FROM A BOSN'N'S CHAIR OR SUSPENDED FROM A ROPE OR CABLE SHALL RECEIVE 40 CENTS PER HOUR ABOVE THE FOREGOING

APPLICABLE CLASSIFICATION RATES. WORKERS DOING GUNITE AND/OR SHOTCRETE WORK IN A TUNNEL SHALL RECEIVE 35 CENTS PER HOUR ABOVE THE FOREGOING APPLICABLE CLASSIFICATION RATES, PAID ON A PORTAL-TO-PORTAL BASIS. ANY WORK PERFORMED ON, IN OR ABOVE ANY SMOKE STACK, SILO, STORAGE ELEVATOR OR SIMILAR TYPE OF STRUCTURE, WHEN SUCH STRUCTURE IS IN EXCESS OF 75'-0"" ABOVE BASE LEVEL AND WHICH WORK MUST BE PERFORMED IN WHOLE OR IN PART MORE THAN 75'-0"" ABOVE BASE LEVEL, THAT WORK PERFORMED ABOVE THE 75'-0"" LEVEL SHALL BE COMPENSATED FOR AT 35 CENTS PER HOUR ABOVE THE APPLICABLE CLASSIFICATION

WAGE RATE	$ 54.93	23.77

LABORER, GUNITE: GROUP 1 RODMEN, NOZZLEMEN

FOOTNOTE: GUNITE PREMIUM PAY: WORKERS WORKING FROM A BOSN'N'S CHAIR OR SUSPENDED FROM A ROPE OR CABLE SHALL RECEIVE 40 CENTS PER HOUR ABOVE THE FOREGOING APPLICABLE CLASSIFICATION RATES. WORKERS DOING GUNITE AND/OR SHOTCRETE WORK IN A TUNNEL SHALL RECEIVE 35 CENTS PER HOUR ABOVE THE FOREGOING APPLICABLE CLASSIFICATION RATES, PAID ON A PORTAL-TO-PORTAL BASIS. ANY WORK PERFORMED ON, IN OR ABOVE ANY SMOKE STACK, SILO, STORAGE ELEVATOR OR SIMILAR TYPE OF STRUCTURE, WHEN SUCH STRUCTURE IS IN EXCESS OF 75'-0"" ABOVE BASE LEVEL AND WHICH WORK MUST BE PERFORMED IN WHOLE OR IN PART MORE THAN 75'-0"" ABOVE BASE LEVEL, THAT WORK PERFORMED ABOVE THE 75'-0"" LEVEL SHALL BE COMPENSATED FOR AT 35 CENTS PER HOUR ABOVE THE APPLICABLE

CLASSIFICATION WAGE RATE	$ 55.88	23.77

LABO1184-001 07/01/2025

	Rates	Fringes
LABORERS:, STRIPING/SLURRY SEAL: GROUP 4 STRIPER: LAYOUT AND APPLICATION OF TRAFFIC STRIPES AND MARKINGS; HOT THERMO PLASTIC; TAPE TRAFFIC STRIPES AND MARKINGS, INCLUDING TRAFFIC CONTROL; OPERATION OF ALL RELATED MACHINERY AND EQUIPMENT	$ 54.35	23.97
LABORERS:, STRIPING/SLURRY SEAL: GROUP 3 TRAFFIC DELINEATING DEVICE APPLICATOR: LAYOUT AND APPLICATION OF PAVEMENT MARKERS, DELINEATING SIGNS, RUMBLE AND TRAFFIC BARS, ADHESIVES, GUIDE MARKERS, OTHER TRAFFIC DELINEATING DEVICES INCLUDING TRAFFIC CONTROL. THIS CATEGORY INCLUDES ALL TRAFFIC RELATED SURFACE PREPARATION (SANDBLASTING, WATERBLASTING, GRINDING) AS PART OF THE APPLICATION PROCESS. TRAFFIC PROTECTIVE DELINEATING SYSTEM INSTALLER: REMOVES, RELOCATES, INSTALLS, PERMANENTLY AFFIXED ROADSIDE AND PARKING DELINEATION BARRICADES, FENCING, CABLE ANCHOR, GUARD RAIL, REFERENCE SIGNS, MONUMENT MARKERS; OPERATION OF ALL RELATED MACHINERY AND EQUIPMENT; POWER BROOM SWEEPER	$ 52.61	23.97
LABORERS:, STRIPING/SLURRY SEAL: GROUP 2 TRAFFIC SURFACE ABRASIVE BLASTER; POT TENDER - REMOVAL OF ALL TRAFFIC LINES AND MARKINGS BY ANY METHOD (SANDBLASTING, WATERBLASTING, GRINDING, ETC.) AND PREPARATION OF SURFACE FOR COATINGS. TRAFFIC CONTROL PERSON: CONTROLLING AND DIRECTING TRAFFIC THROUGH BOTH CONVENTIONAL AND MOVING LANE CLOSURES; OPERATION OF ALL RELATED MACHINERY AND EQUIPMENT	$ 50.60	23.97
LABORERS:, STRIPING/SLURRY SEAL: GROUP 1 PROTECTIVE COATING, PAVEMENT SEALING, INCLUDING REPAIR AND FILLING OF CRACKS BY ANY METHOD ON ANY SURFACE IN PARKING LOTS, GAME COURTS AND PLAYGROUNDS;		

CARSTOPS; OPERATION OF ALL RELATED MACHINERY AND EQUIPMENT; EQUIPMENT REPAIR TECHNICIAN.....$ 49.30 23.97
LABORERS: HORIZONTAL DIRECTIONAL DRILLING: (4) ELECTRONIC TRACKING LOCATOR.....$ 51.96 20.86
LABORERS: HORIZONTAL DIRECTIONAL DRILLING: (3) HORIZONTAL DIRECTIONAL DRILL OPERATOR.....$ 49.96 20.86
LABORERS: HORIZONTAL DIRECTIONAL DRILLING: (2) VEHICLE OPERATOR/HAULER.....$ 48.11 20.86
LABORERS: HORIZONTAL DIRECTIONAL DRILLING: (1) DRILLING CREW LABORER.....$ 47.94 20.86

LABO1414-001 08/06/2025

	Rates	Fringes
LABORER: PLASTER TENDER WORK ON A SWING STAGE SCAFFOLD: $1.00 PER HOUR ADDITIONAL.....	$ 48.72	25.97
LABORER: PLASTER CLEAN-UP LABORER WORK ON A SWING STAGE SCAFFOLD: $1.00 PER HOUR ADDITIONAL.....	$ 46.17	25.97

PAIN0036-007 07/01/2023

	Rates	Fringes
PAINTERS: (5) ALL OTHER WORK.....	$ 36.44	18.58
PAINTERS: (4) INDUSTRIAL.....	$ 41.42	19.04
PAINTERS: (3) JOURNEYMAN PAINTER INCLUDING LEAD ABATEMENT.....	$ 36.44	18.58

PAIN0036-008 09/01/2024

	Rates	Fringes
DRYWALL FINISHER/TAPER.....	$ 49.33	26.82

PAIN0169-002 01/01/2023

	Rates	Fringes
GLAZIER.....	$ 44.33	28.88

PAIN1247-002 01/01/2025

	Rates	Fringes
SOFT FLOOR LAYER.....	$ 45.15	19.43

PLAS0200-001 08/03/2022

	Rates	Fringes
PLASTERER.....	$ 47.37	19.64

PLAS0500-002 07/01/2025

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER.....	$ 47.70	27.07

PLUM0016-001 09/01/2025

	Rates	Fringes
PLUMBER/PIPEFITTER (WORK ONLY ON STRIP MALLS, LIGHT COMMERCIAL, TENANT IMPROVEMENT AND REMODEL WORK).....	$ 44.29	24.16
PLUMBER/PIPEFITTER (ALL OTHER WORK EXCEPT WORK ON NEW ADDITIONS AND REMODELING OF BARS, RESTAURANT, STORES AND COMMERCIAL BUILDINGS NOT TO EXCEED 5,000 SQ. FT. OF FLOOR SPACE AND WORK ON STRIP MALLS, LIGHT COMMERCIAL, TENANT IMPROVEMENT AND REMODEL WORK).....	$ 61.73	26.81
PLUMBER/PIPEFITTER (WORK ONLY ON NEW ADDITIONS AND REMODELING OF BARS, RESTAURANT, STORES AND		

COMMERCIAL BUILDINGS NOT TO EXCEED 5,000 SQ. FT. OF FLOOR SPACE).....$ 59.85 25.83

PLUM0345-001 09/01/2025

	Rates	Fringes
PLUMBER (SEWER & STORM DRAIN WORK)	$ 48.84	23.58
PLUMBER (LANDSCAPE/IRRIGATION FITTER)	$ 44.75	26.20

ROOF0036-002 08/01/2025

	Rates	Fringes
ROOFER FOOTNOTE: PITCH PREMIUM: WORK ON WHICH EMPLOYEES ARE EXPOSED TO PITCH FUMES OR REQUIRED TO HANDLE PITCH, PITCH BASE OR PITCH IMPREGNATED PRODUCTS, OR ANY MATERIAL CONTAINING COAL TAR PITCH, THE ENTIRE ROOFING CREW SHALL RECEIVE $1.75 PER HOUR ""PITCH PREMIUM"" PAY	$ 52.63	20.73

SFCA0669-014 01/01/2026

	Rates	Fringes
SPRINKLER FITTER	$ 49.69	29.72

SHEE0273-002 08/01/2019

	Rates	Fringes
SHEET METAL WORKER HOLIDAYS: NEW YEAR'S DAY, MARTIN LUTHER KING DAY, PRESIDENT'S DAY, GOOD FRIDAY, MEMORIAL DAY, INDEPDENDENCE DAY, LABOR DAY, VETERANS DAY,THANKISGIVING DAY & FRIDAY AFTER, CHRISTMAS DAY	$ 45.48	30.05

TEAM0011-002 07/01/2025

	Rates	Fringes
TRUCK DRIVER GROUP 12 BOOM TRUCK 17K AND ABOVE WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]	$ 44.05	35.69
TRUCK DRIVER GROUP 11 WATER PULL - TWIN ENGINE; WATER PULL - TWIN ENGINE WITH ATTACHMENTS; WINCH TRUCK DRIVER - $1.25 ADDITIONAL WHEN OPERATING WINCH OR SIMILAR SPECIAL ATTACHMENTS WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]	$ 43.62	35.69
TRUCK DRIVER GROUP 10 DUMP TRUCK - 50 YDS. OR MORE WATER LEVEL; WATER PULL - SINGLE ENGINE WITH ATTACHMENT WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]	$ 43.12	35.69
TRUCK DRIVER GROUP 9 TRUCK REPAIR PERSON/WELDER;		

LOW BED DRIVER, 9 AXLES OR OVER WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]..... $ 42.82 35.69

TRUCK DRIVER GROUP 8 DUMP TRUCK, 25 YDS. TO 49 YDS. WATER LEVEL; TRUCK REPAIR PERSON; WATER PULL - SINGLE ENGINE; WELDER WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]..... $ 42.62 35.69

TRUCK DRIVER GROUP 7..... $ 42.37 35.69

TRUCK DRIVER GROUP 6 TRANSIT MIX TRUCK, 3 YDS. OR MORE; DUMPCRETE TRUCK, 6-1/2 YDS. WATER LEVEL AND OVER; VEHICLE OR COMBINATION OF VEHICLES - 4 OR MORE AXLES; OIL SPREADER TRUCK; DUMP TRUCK, 16 YDS. TO 25 YDS. WATER LEVEL WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]... $ 42.12 35.69

TRUCK DRIVER GROUP 5 WATER TRUCK, 3 OR MORE AXLES; TRUCK GREASER AND TIRE PERSON ($0.50 ADDITIONAL FOR TIRE PERSON); PIPELINE AND UTILITY WORKING TRUCK DRIVER, INCLUDING WINCH TRUCK AND PLASTIC FUSION, LIMITED TO PIPELINE AND UTILITY WORK; SLURRY TRUCK DRIVER WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]..... $ 42.09 35.69

TRUCK DRIVER GROUP 4 DRIVER OF TRANSIT MIX TRUCK, UNDER 3 YDS.; DUMPCRETE TRUCK, LESS THAN 6-1/2 YDS. WATER LEVEL WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]..... $ 42.06 35.69

TRUCK DRIVER GROUP 3 DRIVER OF VEHICLE OR COMBINATION OF VEHICLES - 3 AXLES; BOOT PERSON; CEMENT MASON DISTRIBUTION TRUCK; FUEL TRUCK DRIVER; WATER TRUCK - 2 AXLE; DUMP TRUCK, LESS THAN 16 YDS. WATER LEVEL; EROSION CONTROL DRIVER WORK ON ALL MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO & YERMO, MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT, POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]..... $ 41.87 35.69

TRUCK DRIVER GROUP 2 DRIVER OF VEHICLE OR COMBINATION OF VEHICLES - 2 AXLES; TRAFFIC CONTROL PILOT CAR EXCLUDING MOVING HEAVY EQUIPMENT PERMIT

LOAD; TRUCK MOUNTED BROOM WORK ON ALL MILITARY
BASES: PREMIUM PAY: $3.00 PER HOUR ADDITIONAL.
[29 PALMS MARINE BASE, CAMP ROBERTS, CHINA LAKE,
EDWARDS AFB, EL CENTRO NAVAL FACILITY, FORT IRWIN,
MARINE CORPS LOGISTICS BASE AT NEBO & YERMO,
MOUNTAIN WARFARE TRAINING CENTER, BRIDGEPORT,
POINT ARGUELLO, POINT CONCEPTION, VANDENBERG AFB]...$ 41.74 35.69
TRUCK DRIVER GROUP 1 TRUCK DRIVER WORK ON ALL
MILITARY BASES: PREMIUM PAY: $3.00 PER HOUR
ADDITIONAL. [29 PALMS MARINE BASE, CAMP ROBERTS,
CHINA LAKE, EDWARDS AFB, EL CENTRO NAVAL FACILITY,
FORT IRWIN, MARINE CORPS LOGISTICS BASE AT NEBO &
YERMO, MOUNTAIN WARFARE TRAINING CENTER,
BRIDGEPORT,   POINT ARGUELLO, POINT CONCEPTION,
VANDENBERG AFB].....$ 41.59 35.69

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other
health-related needs, including preventive care; or for reasons
resulting from, or to assist a family member (or person who is
like family to the employee) who is a victim of, domestic
violence, sexual assault, or stalking. Additional information
on contractor requirements and worker protections under the EO
is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject
to the Davis-Bacon Act that were awarded on or between January 1,
2015 and January 29, 2022, and that have not been renewed or
extended on or after January 30, 2022. Executive Order 13658 does
not apply to contracts subject only to the Davis-Bacon Related Acts
regardless of when they were awarded. If a contract is subject to
Executive Order 13658, the contractor must pay all covered workers
at least $13.65 per hour (or the applicable wage rate listed on this
wage determination, if it is higher) for all hours spent performing on
the contract from May 11, 2026, through December 31, 2026. The
applicable Executive Order minimum wage rate will be adjusted annually.
Additional information on contractor requirements and worker
protections under Executive Order 13658 is available at
www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications
and wage rates that have been found to be prevailing for the
type(s) of construction and geographic area covered by the wage
determination. The classifications are listed in alphabetical
order under rate identifiers indicating whether the particular
rate is a union rate (current union negotiated rate), a survey

rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than "SU", "UAVG", "SA", or "SC" denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The "SU" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

"SU" wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The "SA" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were

adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the "SA" identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

APPENDIX B

ENVIRONMENTAL PERMIT SUMMARY FORM

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COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING

General Rule Exemption

Project Title and No.: San Luis Obispo Airport Baggage Handling System Expansion / ED25-0218

Project Location and APN:	**Project Applicant/Phone No./Email:**
975 Airport Drive, San Luis Obispo, CA 93401 APN: 076-406-002	The County of San Luis Obispo, Department of Airports / (805) 781-5218 / comjohnson@co.slo.ca.us
	Applicant Address (Street, City, State, Zip): 975 Airport Drive, San Luis Obispo, CA 93401

Description of Nature, Purpose, and Beneficiaries of Project:

The County of San Luis Obispo, Department of Airports proposes to expand their outbound baggage screening area to increase throughput capacity from 125 bags per hour to 200 bags per hour.
The proposed project will consist of the following:

- Temporary expansion of the outbound baggage utilizing a sprung structure, connector, and canopy.
  - This solution is expected to last for five to 10 years until a more permanent solution is implemented.
- Connection to the existing water line for fire suppression
- Installation of underground grounding protection around sprung structure
- Removal and replacement of pavement surrounding sprung structure

The entire project area is paved. The limits of construction for the proposed project are approximately 0.40 acres. As mentioned above, the proposed project will expand the existing baggage handling structure which is currently 56 feet long and 17 feet wide, with a temporary baggage handling structure that will be comprised of two components: a sprung structure which will be 51.6 feet long and 55 feet wide, and a 73.8 foot long and 41 feet wide canopy that will go over the baggage carousel. There is existing soil disturbance from the previous terminal construction with a maximum depth of 15 feet along the northwest end of this project area. Excavation for the new sprung structure foundation will consist of existing asphalt pavement removal, existing aggregate base course removal, two-foot-deep concrete grade beams, five-inch-thick concrete slab on grade, and new six-inch aggregate slab underlayment. Concrete piers will be 30 inches in diameter and will be embedded 10 feet below the surface of the concrete slab. Helical piles will be screwed into the ground at an approximate depth of 15 feet. Given their diameter and quantity, there would be minimal area (in cubic feet) of new soil disturbance from the proposed piling and pier components of the project. The vast majority of the excavation, including the new structural foundation/slab and trenching and other components, would be at a fairly similar depth to existing soil disturbance that occurred during the previous terminal construction and previous pavement construction (when added together).

An estimated 100 cubic yards (cy) of existing pavement, aggregate base, and subgrade material within the project area will be removed and hauled off-site as a result of excavation activities. Approximately 80 cy of structural concrete and 50 cy of crushed aggregate will be brought to the project site for the foundation. An estimated 70 cy of asphalt will also be imported to the project site as a result of the proposed project.

Trenching associated with the storm drain line will occur under existing pavement in soil that has been previously disturbed to a depth of 15 feet. To maintain drainage requirements, a new asphalt overlay of four inches will be placed around the foundation. Within project limits, flow line grading will be performed to allow stormwater runoff to enter nearby existing stormwater catch basins and the terminal drainage system. The vertical depths for the proposed trenching outlined above will not exceed the depths of the existing soil disturbance (which vary from four to 15 feet as previously described). The entire project area is paved, and the horizontal disturbance would encompass 0.4 acres.

The proposed project will be completed in two phases. Phase 1 of the proposed project will consist of the interim outbound baggage system installation. This outbound baggage system will be installed and covered by a temporary canopy that will be roughly eight feet tall and located between the proposed structure and the terminal while the sprung structure is constructed. Phase 1 is anticipated to take 45 days to complete. Phase 2 of the proposed project will consist of the construction of the building pad, site drainage improvements, construction of the sprung structure, installation of the carousel canopy, and installation of the outbound baggage system. The Phase 2 canopy at the make-up area will measure 12.5 feet tall, while the sprung structure will be 25 feet tall with an 18-inch lightning rod on top of the structure. Phase 2 is anticipated to take 270 days to complete.

Construction haul routes will occur on existing airport pavement. Access to the proposed project site will be granted through an existing access gate located on Airport Drive, within the employee parking lot west of the terminal.

Existing land uses at the airport include commercial service operations, fixed based operators, T-hangars (located on the east side of the airport), tiedowns (located on the east and west sides of the airport), and transient parking. The proposed project will occur within airport boundaries. The proposed project site is located west of the existing terminal building.

The proposed parcel is within the Public Facilities land use category and is located at 975 Airport Drive, San Luis Obispo, CA 9340, in the North San Luis Obispo Sub Area of the San Luis Obispo Planning Area.

Name of Public Agency Approving Project: County of San Luis Obispo

Exempt Status/Findings: This project is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. It can be seen with certainty that there is no possibility that this project may have a significant effect on the environment; therefore, the activity is not subject to CEQA. [Reference: State CEQA Guidelines sec. 15061(b)(3), General Rule Exemption].

Reasons why project is exempt: The project scope involves the replacement and reconstruction of an existing baggage handling facility within an existing airport. Site disturbance will occur within an already disturbed area, and the overall footprint will be similar to the existing baggage facility. Therefore, there will be no new ground disturbance. The project is less than 0.5 acres and the overall grading quantities are approximately 300 cy. All material will be handled in accordance with existing regulations.
The project will not generate a significant amount of air emissions, waste, traffic, hazards or hazardous materials, or water use; and the overall operations will be consistent with existing operations. Additionally, the new baggage facility will not result in the expansion of the airport.
Potential impacts on biological resources are not anticipated as the area is already disturbed with existing infrastructure. A Phase I Archaeological Study was conducted in 2022, which determined there are no historical or potentially historical structures on site, and there are no know cultural materials; therefore, impacts to historical or cultural impacts are not anticipated and are considered less than significant. Potential

impacts on drainage, energy, and greenhouse gas emissions are not anticipated or are less than significant as the project is subject to the California Building Code and County standards for grading and drainage. The project will not result in additional operational noise generating activities, and construction activities will occur during normal business hours. Additionally, there are no residences near the work area.

Additional Information: Additional information pertaining to this notice of general rule exemption may be found on the next page of this document and by contacting the Planning and Building Department, 976 Osos St., Rm 200, San Luis Obispo, CA 93408 (805) 781-5600.

Notice of General Rule Exemption

Project Title and No.: San Luis Obispo Airport Baggage Handling System Expansion / ED25-0218

Pursuant to section 15061 of the State California Environmental Quality Act (CEQA) Guidelines, the preliminary review of a project includes a determination as to whether a project is exempt from CEQA. This checklist represents a summary of this project's review for exemption.

		YES	NO
1.	Does this project fall within any exempt class as listed in sections 15301 through 15333 of the State CEQA Guidelines?	☐	☒
2.	Is there a reasonable possibility that the project could have a significant effect on the environment due to unusual circumstances?	☐	☒
3.	Is the project inconsistent with any Federal, State, or local law or administrative requirement relating to the environment?	☐	☒
4.	Will the project involve substantial public controversy regarding environmental issues?	☐	☒
5.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒
6.	Does the project have the potential to achieve short-term environmental goals to the disadvantage of achieving long-term environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)	☐	☒
7.	Does the project have adverse impacts which are individually insignificant, but cumulatively significant? Cumulatively significant means that the incremental effects of an individual project are substantially adverse when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.	☐	☒
8.	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒

On the basis of this initial evaluation, I find that the proposed project does not have the potential to cause a significant effect on the environment and is therefore exempt from CEQA.

Eric Hughes (ehughes@co.slo.ca.us) (805) 781-1591

Lead Agency Contact Person **Telephone**

Signature: Date:

If filed by applicant:
1. Attach certified document of exemption finding
2. Has a notice of exemption been filed by the public agency approving the project? Yes ☐ No ☐

On _____the project was approved by:

☒ Board of Supervisors ☐ Subdivision Review Board ☐ Chief Building Official

☐ Planning Commission ☐ Planning Dept Hearing Officer ☐ Other_____

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
San Francisco Airports District Office

12999 Oak Rd, Suite 200
Walnut Creek, CA 94597

June 30, 2025

San Luis Obispo County Regional Airport
Courtney M. Johnson, Airports Director
975 Airport Drive, Suite 1
San Luis Obispo, CA 93401

Subject: Proposed Project Categorical Exclusion at San Luis Obispo County Regional Airport

Dear Ms. Johnson:

The Federal Aviation Administration (FAA) has reviewed the environmental information you submitted for the Temporary Outbound Baggage Handling System Expansion Project at the San Luis Obispo County Regional Airport (SBP), San Luis Obispo, California. The enclosed figure highlights the area of the proposed project. The FAA has determined the proposed project is Categorically Excluded pursuant to FAA Order 1050.1F as it relates to the National Environmental Policy Act of 1969, as amended (NEPA). Therefore, no further federal environmental disclosure documentation for the project components is necessary for NEPA purposes.

This letter notifies you that the proposed project has complied with NEPA only. This is not a notice of final project approval of funding availability.

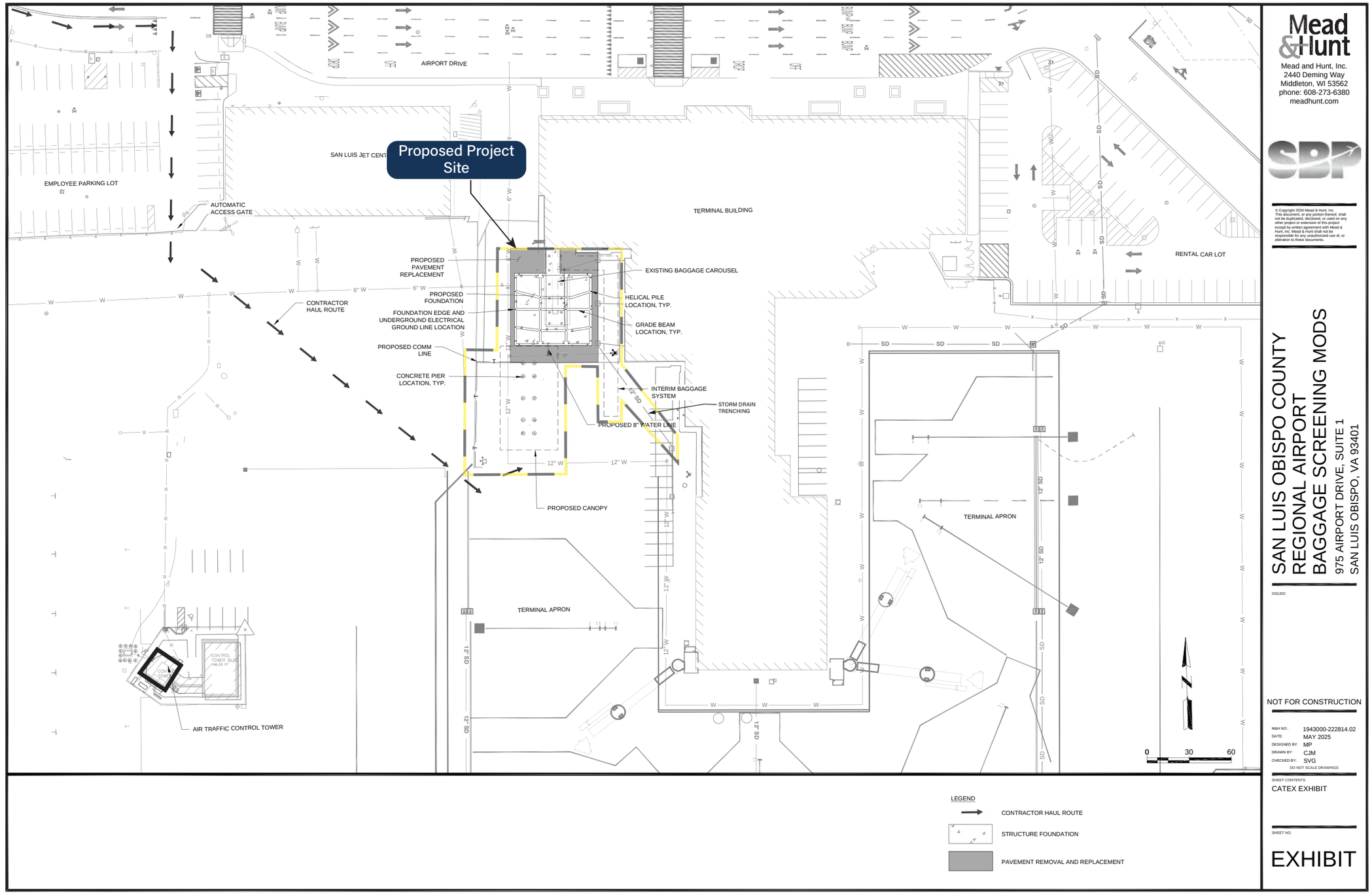
If you have any questions regarding this matter, I am available at 925-546-6441, or by email at Christopher.D.Jones@faa.gov.

Sincerely,

Christopher D. Jones

Christopher D. Jones, Ph.D.
Environmental Protection Specialist

Enclosure



Mead & Hunt
Mead and Hunt, Inc.
2440 Deming Way
Middleton, WI 53562
phone: 608-273-6380
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SAN LUIS OBISPO COUNTY
REGIONAL AIRPORT
BAGGAGE SCREENING MODS
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, VA 93401

ISSUED

NOT FOR CONSTRUCTION

M&H NO.: 1943000-222814.02
DATE: MAY 2025
DESIGNED BY: MP
DRAWN BY: CJM
CHECKED BY: SVG
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CATEX EXHIBIT

SHEET NO.

EXHIBIT

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5/16/2025 2:42:36 PM

Documented Categorical Exclusion
(per SOP No. 5.2, Appendix A and FAA Order 1050.1F)

Temporary Outbound Baggage Handling System Expansion
At
San Luis Obispo County Regional Airport

Prepared By:

Coffman Associates

On Behalf Of:

San Luis Obispo County
California

revised May 2025

APPENDIX A. DOCUMENTED CATEX

Airport sponsors may use this form for projects eligible for a categorical exclusion (CATEX) that have greater potential for extraordinary circumstances or that otherwise require additional documentation, as described in the FAA Order 1050.1 (current version) and FAA Order 5050.4B (collectively, FAA Environmental Orders).

To request a CATEX determination from the FAA, the sponsor should review potentially affected environmental resources, review the requirements of the applicable special purpose laws, and consult with the Airports District Office or Regional Airports Division Office staff about the type of information needed. The form and supporting documentation should be completed in accordance with the provisions of FAA Order 5050.4B, paragraph 302b, and submitted to the appropriate FAA Airports District/Division Office. The CATEX cannot be approved until all information /documentation is received and all requirements have been fulfilled.

Name of Airport, LOC ID, and location:

San Luis Obispo County Regional Airport (SBP)
975 Airport Drive
San Luis Obispo, CA 93401

Project Title:

Temporary Outbound Baggage Handling System Expansion

Give a brief, but complete description of the proposed project, including all project components, justification, estimated start date, and duration of the project. Include connected actions necessary to implement the proposed project (including but not limited to moving NAVAIDs, change in flight procedures, haul routes, new material or expanded material sources, staging or disposal areas). Attach a sketch or plan of the proposed project. Photos can also be helpful.

Project Justification/Project Description

Currently, San Luis Obispo County Regional Airport's (SBP) outbound baggage screening area can only process 125 bags per hour. This is due to the existing location of the baggage handling system diverter and the distance between the ticket counters and the explosives detection system (EDS) machine. These conditions cause a decrease in bag throughput. In addition, once the bags go through screening, they begin to pile up on the existing baggage make-up belt because space is limited. This issue is anticipated to further exacerbate, as there has been an increase in aircraft size at the airport. The proposed project will help meet the current and near-term outbound baggage screening needs of a growing airport. The proposed improvements will expand the baggage screening facility and systems for efficient baggage throughput and make-up capacity so that 200 bags can be processed per hour.

*The proposed project will consist of the following elements (**Attachment 1, Exhibit 1**):*

- *Temporary expansion of the outbound baggage utilizing a sprung structure, connector, and canopy*
  - *This solution is expected to last for five to 10 years until a more permanent solution is implemented.*
- *Connection to the existing water line for fire suppression*
- *Installation of underground grounding protection around sprung structure*

- *Removal and replacement of pavement surrounding sprung structure*

The limits of construction for the proposed project are approximately 0.40 acres. As mentioned above, the proposed project will expand the existing baggage handling structure which is currently 56 feet long and 17 feet wide, with a temporary baggage handling structure that will be comprised of two components: a sprung structure which will be 51.6 feet long and 55 feet wide, and a 73.8 foot long and 41 feet wide canopy that will go over the baggage carousel. Excavation for the new sprung structure foundation will consist of existing asphalt pavement removal, existing aggregate base course removal, two-foot-deep concrete grade beams, five-inch-thick concrete slab on grade, and new six-inch aggregate slab underlayment. Concrete piers will be 30 inches in diameter and will be embedded 10 feet below the surface of the concrete slab. Helical piles will be screwed into the ground at an approximate depth of 15 feet. Previous disturbances have occurred to depths of 15 feet below existing grade within the baggage expansion area. No new soil disturbance is anticipated as a result of the proposed project.

An estimated 100 cubic yards (cy) of existing pavement, aggregate base, and subgrade material within the project area will be removed and hauled off-site as a result of excavation activities. Approximately 80 cy of structural concrete and 50 cy of crushed aggregate will be brought to the project site for the foundation. An estimated 70 cy of asphalt will also be imported to the project site as a result of the proposed project.

*Utilities for the project will include electrical improvements and the installation of a water line and a storm water line (**Attachment 1, Exhibit 1**). Trenching for electrical improvements will be contained within the foundation excavation and will include the installation of a new counterpoise and ground rods. Communication line trenching will be contained within the existing aggregate base of the concrete pavement and will be two feet deep and six inches wide. Communication line installation will be 112 linear feet (lf). A short water (nine lf) is also needed to connect to an existing water line. The new water line trenching will be approximately four feet deep and three feet wide. Storm drain line trenching will be approximately three feet deep and two feet wide. Storm drain line installation will be 24 lf. To maintain drainage requirements, a new asphalt overlay of four inches will be placed around the foundation. Within project limits, flow line grading will be performed to allow stormwater runoff to enter nearby existing stormwater catch basins and the terminal drainage system.*

The federal action is the use of federal funds.

<u>Overall Construction Activity</u>

Pending environmental approvals and funding, the proposed project is expected to begin construction in September 2026 and end in October 2026. No runway closures will occur because of the proposed project. Minimal night work will be involved in moving equipment from the interim structure to the permanent one.

The proposed project will be completed in two phases. Phase 1 of the proposed project will consist of the interim outbound baggage system installation. This outbound baggage system will be installed and covered by a temporary canopy that will be roughly eight feet tall and located between the proposed structure and the terminal while the sprung structure is constructed. Phase 1 is anticipated to take 45 days to complete. Phase 2 of the proposed project will consist of the construction of the building pad, site drainage improvements, construction of the sprung structure, installation of the carousel canopy, and installation of the outbound baggage system. The Phase 2 canopy at the make-up area will measure 12.5 feet tall, while the sprung structure will be 25 feet tall with an 18-inch lightning rod on top of the structure. Phase 2 is anticipated to take 270 days to complete.

Construction haul routes will occur on existing airport pavement. Access to the proposed project site will be granted through an existing access gate located on Airport Drive, within the employee parking lot west of the terminal. Alternate access to the site will be maintained at the existing gate located on Aviadores Way next to the aircraft rescue and firefighting (ARFF) building. Construction employee vehicle parking will be located outside the Air Operations Area (AOA) in an existing parking area off Old Santa Fe Road.

Give a brief, but complete, description of the proposed project area. Include any unique or natural features within or surrounding airport property.

San Luis Obispo County Regional Airport is in the central portion of San Luis Obispo County, California, west of State Route 227, three miles south of the downtown area of the City of San Luis Obispo. The airport is bounded to the west by industrial land uses, to the east by commercial land uses, to the northeast by residential neighborhoods, and to the south by open space and agriculture. Although San Luis Obispo County contains a large portion of land used for agricultural purposes, the land uses surrounding the airport are characterized as typical suburban development.

Existing land uses at the airport include commercial service operations, fixed based operators (FBOs), T-hangars (located on the east side of the airport), tiedowns (located on the east and west sides of the airport), and transient parking. The proposed project will occur within airport boundaries. The proposed project site is located west of the existing terminal building, south of Airport Parking Lot 4.

The airport includes two runways: Runway 11-29 and Runway 7-45. Runway 11-29 is accessed by a parallel taxiway that runs the full length of the runway along its north side (Taxiway A) and is utilized by commercial aircraft (both passenger and cargo). Runway 7-25 is accessed by a full-length parallel taxiway (Taxiway J) and is primarily utilized by private pilots.

West of the airfield and Hoover Avenue is a part of the airport property that is transected by the east fork of San Luis Obispo Creek. This area is referred to as the Chevron property. West of the creek are seasonal wetlands that provide habitat for vernal pools and vernal pool fairy shrimp, a federally listed endangered species.

Identify the appropriate CATEX paragraph(s) from the current version on Order 1050.1 or 5050.4B (Tables 6-1 and 6-2) that apply to the project. Describe if the project differs in any way from the specific language of the CATEX or examples given as described in the Order.

5-6.4. Categorical Exclusions for Facility Siting, Construction, and Maintenance

h. Federal financial assistance, licensing, or airport layout plan (ALP) approval for construction or expansion of facilities – such as terminal passenger handling and parking facilities, cargo buildings, or facilities for non-aeronautical uses at existing airports and commercial space launch sites – that do not substantially expand those facilities; see the FAA's presumed to conform list (72 Federal Register 41565 [July 30, 2007]). (All)

o. Minor trenching and backfilling where the surface is restored and the excavated material is protected against erosion and runoff during the construction period. (ATO, ARP, AST)

The circumstances one must consider when documenting a CATEX are listed below along with each of the impact categories related to the circumstance. Use FAA Environmental Orders and the Desk Reference for Airports Actions, as well as other guidance documents to assist you in determining what information needs to be provided about these impact categories to address potential impacts. Keep in mind that FAA must analyze both construction and operational impacts. Indicate whether or not there would be any effects under the particular impact category and, **if needed**, cite available references to support these conclusions. Additional analyses and inventories can be attached or cited as needed.

5-2.b(1) National Historic Preservation Act (NHPA) resources	**YES**	**NO**
Are there historic/cultural resources listed (or eligible for listing) on the National Register of Historic Places located in the Area of Potential Effect? If yes, provide a record of the historic/cultural resources located therein and check with your local Airports Division/District Office to determine if a Section 106 finding is required. *The airport has been subject to several cultural resource surveys over the years. A cultural resource records search conducted by SWCA Environmental Consultants in 2022 confirmed no evidence of historic/cultural sites within airport boundaries. The proposed project's direct area of potential effect (APE) is shown on* ***Attachment 1, Exhibit 2****. The vertical APE is a maximum of 15 feet with most ground disturbance occurring less than 10 feet. The project area has been previously disturbed to depths of 15 feet due to grading and excavation for the existing terminal building. Thus, no impacts to native soil will occur.* *Based on a review of historical aerials for the airport, there are no buildings or airport facilities of historic age (i.e., 50 years or older) near the proposed project site.* *Sources: SWCA Environmental Consultants, San Luis Obispo Regional Airport Cultural Resources Records Search Project, San Luis Obispo, San Luis Obispo County, California SWCA No. 77662 (December 2022); Historic Aerials (https://www.historicaerials.com/viewer), accessed March 2024*	☐	☒
Does the project have the potential to cause effects? If yes, describe the nature and extent of the effects. *No impacts to known historic/cultural resources will occur from the proposed project. The proposed project will be located on paved areas of the airport. If resources are discovered during construction, standard inadvertent discovery practices will be followed. (See Environmental Commitments.)*	☐	☒
Is the project area undisturbed? If not, provide information on the prior disturbance (including type and depth of disturbance, if available). *The project area has been previously disturbed to depths of 15 feet due to grading and excavation for the existing terminal building.*	☐	☒

Will the project impact tribal land or land of interest to tribes? If yes, describe the nature and extent of the effects and provide information on the tribe affected. Consultation with their THPO or a tribal representative along with the SHPO may be required. *The project area is not near a federally recognized tribe. The closest federally recognized tribe (Santa Ynez Band of Chumash Mission Indians) is located 61 miles south of the airport.* *Source: U.S. EPA, Map of Federally Recognized Tribes in EPA's Pacific Southwest (Region 9) (https://www.epa.gov/tribal-pacific-sw/map-federally-recognized-tribes-epas-pacific-southwest-region-9)*	☐	☒

5-2.b(2) Department of Transportation Act Section 4(f) and 6(f) resources	**YES**	**NO**
Are there any properties protected under Section 4(f) (as defined by FAA Order 1050.1) in or near the project area? This includes publicly owned parks, recreation areas, and wildlife or waterfowl refuges of national, state, or local significance or land from a historic site of national, state, or local significance. *There are no recorded or eligible National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) resources within airport boundaries. Additionally, there are no public recreation areas within 0.25 miles of the airport. The closest wildlife refuge, Pacific Wildlife Care, is 17 miles from the airport.* *Source: National Register of Historic Places (https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466); Google Earth Pro Aerial Imagery, accessed December 2023*	☐	☒
Will the project construction or operation physically or constructively "use" any Section 4(f) resource? If yes, describe the nature and extent of the use/impacts, and why there are no prudent and feasible alternatives. See 5050.4B Desk Reference Chapter 7. *The proposed project will not physically or constructively "use" any Section 4(f) resource.*	☐	☒
Will the project affect any recreational or park land purchased with Section 6(f) Land and Water Conservation Funds? If so, please explain, if there will be impacts to those properties. *There are no recreational or park lands purchased with Section 6(f) Land and Water Conservation Funds within the project area.*	☐	☒

5-2.b(3) Threatened or Endangered Species	**YES**	**NO**
Are there any federal or state listed endangered, threatened, or candidate species or designated critical habitat in or near the project area? This includes species protected by individual statute, such as the Bald Eagle. *There are twenty-two proposed threatened, threatened, or endangered species under the federal Endangered Species Act that should be considered as part of an effect analysis for the project (**Attachment 2**): giant kangaroo rat (Dipodomys ingens), California condor (Gymnogyps californianus), California least tern (Sterna antillarum browni), California Ridgway''s rail (Rallus obsoletus obsoletus), least Bell's vireo (Vireo bellii pusillus), marbled murrelet (Brachyramphus marmoratus), western snowy plover (Charadrius nivosus nivosus), yellow-billed cuckoo (Coccyzus americanus), southwestern pond turtle (Actinemys pallida), California red-legged frog (Rana draytonii), foothill yellow-legged frog (Rana boylii), tidewater goby (Eucyclogobius newberryi), monarch butterfly (Danaus plexippus), vernal pool fairy shrimp (Branchinecta lynchi), California jewelflower (Caulanthus californicus), Chorro Creek bog thistle (Cirsium fontinale var. obispoense), Gambel's watercress (Rorippa gambellii), Indian knob mountainbalm (Eriodictyon altissimum), Morro manzanita (Arctostaphylos morroensis), Pismo clarkia (Clarkia speciosa ssp. immaculata), salt marsh bird's-beak (Cordylanthus maritimus ssp. maritimus), and spreading navarretia (Navarretia fossalis).* *No critical habitats have been identified within airport boundaries.* *Source: U.S. Fish & Wildlife Service, IPaC – Information for Planning and Consultation (https://ipac.ecosphere.fws.gov/location/index)*	☒	☐
Does the project affect or have the potential to affect, directly or indirectly, any federal or state-listed, threatened, endangered or candidate species, or designated habitat under the Endangered Species Act? If yes, Section 7 consultation between the FAA and the US Fish & Wildlife Service, National Marine Fisheries Service, and the appropriate state agency will be necessary. Provide a description of the impacts and how impacts will be avoided, minimized, or mitigated. Provide the Biological Assessment and Biological Opinion, if required. *The proposed project will not affect, directly or indirectly, any federal or state-listed threatened, endangered, or candidate species or designated habitats under the Endangered Species Act. The proposed project will be located entirely on paved areas of the airport. No suitable habitats for the species listed above are listed in the Information for Planning and Consultation (IPaC) database and there are no wetlands or vernal pools within the affected environment.* *The closest vernal pool habitat is west of the east fork of the San Luis Obispo Creek and is separated from the project's work areas and staging/stockpile area by both the creek and Hoover Avenue.* *Source: ESA, San Luis Obispo County Regional Airport Vernal Pool Branchiopod Habitat Assessment, May 5, 2006*	☐	☒

Does the project have the potential to take birds protected by the Migratory Bird Treaty Act? Describe steps to avoid, minimize, or mitigate impacts (such as timing windows determined in consultation with the US Fish & Wildlife Service). *The proposed project will be located on paved areas of the airport and will not provide suitable habitat for migratory birds.*	☐	☒

5-2.b(4) Other Resources

Items to consider include:

a. Fish and Wildlife Coordination Act	**YES**	**NO**
Does the project area contain resources protected by the Fish and Wildlife Coordination Act? If yes, describe any impacts and steps taken to avoid, minimize or mitigate impacts. *The project area is in a developed part of an airport.*	☐	☒
b. Wetlands and Other Waters of the U.S.	**YES**	**NO**
Are there any wetlands or other waters of the U.S. in or near the project area? *There are no waters of the U.S. within the project area, which is entirely paved (**Attachment 3**). The closest mapped wetland (0.30 miles north of the project area) is classified as a freshwater forested/shrub wetland. This wetland is isolated and does not contain a continuous surface connection to traditional navigable waters; thus, it is not considered a water of the U.S., based on the Final Rule published by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) on September 1, 2023.* *Source: National Wetlands Inventory, Surface Waters and Wetlands Mapper (https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/), accessed December 2023*	☐	☒
Has wetland delineation been completed within the proposed project area? If yes, please provide U.S. Army Corp of Engineers (USACE) correspondence and jurisdictional determination. If delineation was not completed, was a field check done to confirm the presence/absence of wetlands or other waters of the U.S.? If no to both, please explain what methods were used to determine the presence/absence of wetlands. *The project area is entirely paved and does not contain waters of the U.S.*	☐	☒
If wetlands are present, will the project result in impacts, directly or indirectly (including tree clearing)? Describe any steps taken to avoid, minimize, or mitigate the impact. *See previous responses. There are no wetlands in or near the project area.*	☐	☒
Is a USACE Clean Water Act Section 404 permit required? If yes, does the project fall within the parameters of a general permit? If so, which general permit?	☐	☒

c. Floodplains	**YES**	**NO**
Will the project be located in, encroach upon or otherwise impact a floodplain? If yes, describe impacts and any agency coordination or public review completed including coordination with the local floodplain administrator. Attach the FEMA map if applicable and any documentation. *The project area is mapped by the Federal Emergency Management Agency (FEMA) as Zone X, Area of Minimal Flood Hazard (FIRM Panel 06079C1332G eff. 11/16/2012) (**Attachment 4**). There are no 100-year or 500-year floodplains within the project area.* *Source: FEMA's National Flood Hazard Layer (NFHL) (https://msc.fema.gov/portal/search?AddressQuery=San%20luis%20obispo%20#searchresultsanchor), accessed December 2023*	☐	☒
d. Coastal Resources	**YES**	**NO**
Will the project occur in or impact a coastal zone as defined by the State's Coastal Zone Management Plan? If yes, discuss the project's consistency with the State's CZMP. Attach the consistency determination if applicable? *The closest coastal zone is more than five miles west of the airport.* *Source: California Coastal Commission – Coastal Maps (https://www.coastal.ca.gov/maps/czb/), accessed December 2023*	☐	☒
Will the project occur in or impact the Coastal Barrier Resource System as defined by the US Fish & Wildlife Service?	☐	☒
e. National Marine Sanctuaries	**YES**	**NO**
Is a National Marine Sanctuary located in the project area? If yes, discuss the potential for the project to impact that resource. *The closest National Marine Sanctuary is Channel Islands National Marine Sanctuary, which is located more than 85 miles south of the airport.* *Sources: National Marine Sanctuaries (https://sanctuaries.noaa.gov/); Google Earth Pro Aerial Imagery, accessed December 2023*	☐	☒
f. Wilderness Areas	**YES**	**NO**
Is a Wilderness Area located in the project area? If yes, discuss the potential for the project to impact that resource. *The closest Wilderness Area is Santa Lucia Wilderness, which is protected by the Bureau of Land Management and U.S. Forest Service and is located more than 27 miles east of the airport.* *Source: Wilderness Connect (https://umontana.maps.arcgis.com/apps/webappviewer/index.html?id=a415bca07f0a4bee9f0e894b0db5c3b6), accessed December 2023*	☐	☒

g. Farmland	**YES**	**NO**
Is there prime, unique, state, or locally important farmland in/near the project area? Describe any significant impacts from the project. *The project area is entirely covered with pavement. The airport is mapped as Urban or Built-Up land by the State of California.* *Source: California Important Farmland Map (https://umontana.maps.arcgis.com/apps/webappviewer/index.html?id=a415bca07f0a4bee9f0e894b0db5c3b6)*	☐	☒
Does the project include the acquisition and conversion of farmland? If farmland will be converted, describe coordination with the US Natural Resources Conservation and attach the completed Form AD-1006. *See previous response. The proposed project does not require the acquisition or conversion of farmland.*	☐	☒
h. Energy Supply and Natural Resources	**YES**	**NO**
Will the project change energy requirements or use consumable natural resources either during construction or operations? *The proposed project will consume natural resources like fossil fuels during the construction of the baggage handling area expansion. Once operational, the project would minimally increase the amount of energy used within the airport's terminal building.*	☒	☐
Will the project change aircraft/vehicle traffic patterns that could alter fuel usage either during construction or operations?	☐	☒
i. Wild and Scenic Rivers	**YES**	**NO**
Is there a river on the Nationwide Rivers Inventory, a designated river in the National System, or river under State jurisdiction (including study or eligible segments) near the project? *The closest wild and scenic river is Sisquoc River, located more than 30 miles south of the airport. The nearest Nationwide Rivers Inventory feature is Sespe Creek, located more than 111 miles from the airport.* *Sources: National Wild and Scenic River System (https://nps.maps.arcgis.com/apps/MapJournal/index.html?appid=ba6debd907c7431ea765071e9502d5ac#); Nationwide Rivers Inventory (https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977), accessed December 2023*	☐	☒
Will the project directly or indirectly affect the river or an area within ¼ mile of its ordinary high-water mark? *The proposed project will not directly or indirectly impact the river or an area within ¼ mile of its ordinary high-water mark.*	☐	☒

j. Solid Waste Management	**YES**	**NO**
Does the project (either the construction activity or the completed, operational facility) have the potential to generate significant levels of solid waste? If so, discuss how these will be managed. *Neither construction nor operation of the proposed project would generate significant levels of solid waste, i.e., more than what would normally occur for a project of similar size or use.* *An estimated 100 cy of existing pavement, aggregate base, and subgrade material within the project area will be removed and hauled off-site as a result of excavation activities. This solid waste will be taken to a facility that accepts construction waste by the contractor per state recycling requirements. No additional solid waste will be generated during the long term.*	☐	☒

5-2.b(5) Disruption of an Established Community	**YES**	**NO**
Will the project disrupt a community, planned development or be inconsistent with plans or goals of the community? *The proposed project will be located within the airport and will not disrupt local communities. No changes to off-site land use or planned development within the surrounding community will occur because of the proposed project.*	☐	☒
Are residents or businesses being relocated as part of the project?	☐	☒

5-2.b(6) Surface Transportation	**YES**	**NO**
Will the project cause a significant increase in surface traffic congestion or cause a degradation of level of service provided?	☐	☒
Will the project require a permanent road relocation or closure? If yes, describe the nature and extent of the relocation or closure and indicate if coordination with the agency responsible for the road and emergency services has occurred. *The proposed project will not require a permanent road relocation or closure.*	☐	☒

5-2.b(7) Noise	**YES**	**NO**
Will the project result in an increase in aircraft operations, nighttime operations, or change in aircraft fleet mix? *No increase in aircraft operations, nighttime operations, or change in aircraft fleet mix will occur because of the project.*	☐	☒
Will the project cause a change in airfield configuration, runway use, or flight patterns either during construction or after the project is implemented? *The proposed project is not located on the airfield.*	☐	☒

Does the forecast exceed 90,000 annual propeller operations, 700 annual jet operations or 10 daily helicopter operations or a combination of the above? If yes, a noise analysis may be required if the project would result in a change in operations. *According to the 2024 Terminal Area Forecast (TAF) report, 74,958 operations were reported at the airport for 2023. Based on the Traffic Flow Management System Counts (TFMSC) database, there were 13,162 jet and 133 helicopter operations from January-December 2023; however, there are likely to be more jet operations and 133 helicopter operations occurring on an annual basis, as the TFMSC only includes data for flights under instrument flight rules (IFR) that are captured by the FAA's enroute computers.* *Sources: FAA Terminal Area Forecast (TAF), APO Terminal Area Forecast Detail Report, Forecast Issued January 2024 (https://taf.faa.gov/Home/RunReport); Traffic Flow Management System Counts (TFMSC) (https://aspm.faa.gov/tfms/sys/Airport.asp)*	☒	☐
Has a noise analysis been conducted, including but not limited to generated noise contours, a specific point analysis, area equivalent method analysis, or other screening method? If yes, provide the documentation. *A noise analysis has not been conducted for the proposed project because it would not increase airport activity; however, overall airport noise contours were completed in 2015 as part of the SBP Airport Land Use Plan (Figure 4.2).* *Source: RS&H, Amended and Restated San Luis Obispo County Regional Airport (SBP) Airport Land Use Plan (March 26, 2021)*	☐	☒
Could the project have a significant impact (DNL 1.5 dB or greater increase) on noise levels over noise sensitive areas within the 65+ DNL noise contour? *Over the long term, there will be no significant impact to noise levels because of the proposed project. Short-term noise will be created from construction activities. Temporary construction noise will not be significant; there are no noise-sensitive receptors within 0.30 miles of the project area and the nearest residential area is buffered by an industrial/business park, an actively used roadway, and mature trees.*	☐	☒

5-2.b(8) Air Quality	**YES**	**NO**
Is the project located in a Clean Air Act non-attainment or maintenance area? *San Luis Obispo County (eastern part only) is in nonattainment for ozone (2008 and 2015) (marginal) federal standards. The airport is not located in eastern San Luis Obispo County.* *Source: U.S. EPA Greenbook, California Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants (https://www3.epa.gov/airquality/greenbook/anayo_ak.html), accessed December 2023*	☐	☒

If yes, is it listed as exempt, presumed to conform or will emissions (including construction emissions) from the project be below *de minimis* levels (provide the paragraph citation for the exemption or presumed to conform list below, if applicable). Is the project accounted for in the State Implementation Plan or specifically exempted? Attach documentation. *Not applicable. The airport is in a portion of San Luis Obispo County that is in attainment for all federal criteria pollutants (see previous response).*	☐	☐
Does the project have the potential to increase landside or airside capacity, including an increase of surface vehicles? *The proposed project will not increase landside or airside capacity or increase the number of surface vehicles.*	☐	☒
Could the project impact air quality or violate local, State, Tribal or Federal air quality standards under the Clean Air Act Amendments of 1990 either during construction or operations? *See previous response. The proposed project will not generate additional aircraft operations or vehicular traffic; therefore, additional air quality emissions will not impact local, state, tribal, or federal air quality standards.*	☐	☒

5-2.b(9) Water Quality	**YES**	**NO**
Are there water resources within or near the project area? These include groundwater, surface water (lakes, rivers, etc.), sole source aquifers and public water supply. If yes, provide a description of the resource, including the location (distance from project site, etc.). *The proposed project is in the Lower San Luis Obispo Creek watershed. There are no surface waters or other water resources within the affected environment of this project. The east fork of San Luis Creek is west of the airport and is separated from the project's affected environment by Hoover Avenue.* *The nearest sole source aquifer is Fresno County Aquifer, located more than 85 miles northeast of the airport.* *Sources: U.S. EPA's How's My Waterway (https://mywaterway.epa.gov/community/san%20luis%20obispo%20airport/overview); U.S. EPA Sole Source Aquifer (https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b), accessed December 2023*	☐	☒
Will the project impact any of the identified water resources either during construction or operations? Describe any steps that will be taken to protect water resources during and after construction. *See previous response.*	☐	☒

Will the project increase the amount or rate of stormwater runoff either during construction or during operations? Describe any steps that will be taken to ensure it will not impact water quality. *The proposed project will not increase the amount of stormwater runoff because the project area is already completely covered with impervious surfaces. The proposed project will expand the outbound baggage room using a sprung structure, connector, and canopy. During construction, flow line grading will occur within the proposed limits of disturbance to allow stormwater runoff to enter nearby existing stormwater catch basins and the terminal apron drainage system.*	☐	☒
Does the project have the potential to violate federal, state, tribal or local water quality standards established under the Clean Water and Safe Drinking Water Acts? *See previous response.*	☐	☒
Are any water quality related permits required? If yes, list the appropriate permits. *The proposed project will not require the State of California's National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit to be applied to the project due to the amount of ground disturbance (i.e., less than one acre).*	☐	☒

5-2.b(10) Highly Controversial on Environmental Grounds **YES** **NO**

Is the project highly controversial? The term "highly controversial" means a substantial dispute exists as to the size, nature, or effect of a proposed federal action. The effects of an action are considered highly controversial when reasonable disagreement exists over the project's risk of causing environmental harm. Mere opposition to a project is not sufficient to be considered highly controversial on environmental grounds. Opposition on environmental grounds by a federal, state, or local government agency or by a tribe or a substantial number of the persons affected by the action should be considered in determining whether or not reasonable disagreement exists regarding the effects of a proposed action. *There has been no indication that the proposed project is controversial.*	☐	☒

5-2.b(11) Inconsistent with Federal, State, Tribal or local Law **YES** **NO**

Will the project be inconsistent with plans, goals, policy, zoning, or local controls that have been adopted for the area in which the airport is located? *The proposed project is within airport boundaries and will not disrupt any local land uses surrounding airport property.*	☐	☒
Is the project incompatible with surrounding land uses? *The proposed project is on airport property and is surrounded by compatible land uses. The project area is surrounded by other airport facilities, commercial land uses, and office land uses.*	☐	☒

5-2.b(12) Light Emissions, Visual Effects, and Hazardous Materials

a. Light Emissions and Visual Effects	**YES**	**NO**
Will the proposed project produce light emission impacts? *Lighting included in the proposed project will be directed downward on the baggage handling facility.*	☐	☒
Will there be visual or aesthetic impacts as a result of the proposed project or have there been concerns expressed about visual/aesthetic impacts? *The proposed project is contained within current airport boundaries and is not visible off the airport property.*	☐	☒
b. Hazardous Materials	**YES**	**NO**
Does the project involve or affect hazardous materials? *Common hazardous materials, such as fossil fuels, will be present for construction equipment and vehicles during the construction of the proposed project. All construction activity will be subject to existing permit procedures for the handling, transporting, and disposal of hazardous materials. The contractors shall follow standard hazardous materials containment procedures and best management practices (BMPs), should an inadvertent spill occur. (See Environmental Commitments.)*	☒	☐
Will construction take place in an area that contains or previously contained hazardous materials? *The proposed project is not located near any Superfund sites; however, the airport is a formerly used defense site (FUDS) (Site J09CA7088). This site is not on the National Priorities List. According to the San Luis Obispo Airport 2021 FUDS Program Management Action Plan, there are no Installation Restoration Program (IRP) or Military Munitions Response Program (MMRP) projects for this site (**Attachment 5**); thus, there are no ongoing or pending FUDS action at this site.* *One resolved leaking underground storage tank (LUST) was located in the area of the airport that is now used as Parking Lot 3. This tank has been removed and is now recorded as "case closed" (i.e., cleanup has been completed) by the State Water Resources Control Board. There is no known contamination within the project area.* *It is not expected that this project will involve any materials contaminated with hazardous waste; however, if hazardous contamination is suspected during construction (i.e., soil staining, fumes, etc.), the affected material will be tested for hazardous materials before being disposed of per applicable state regulations. (See Environmental Commitments.)* *Sources: San Luis Obispo Airport, Formerly Used Defense Sites Program Management Action Plan (Data as of 2021 Annual Report to Congress); U.S. EPA EJScreen (https://ejscreen.epa.gov/mapper/); EnviroStor (https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=san+luis+obispo+regional+airport); Defense Environmental Restoration Program, Formerly Used Defense Sites, Findings of Determination and Eligibility, San Luis Obispo County Airport, San Luis Obispo, CA, Site No. J09CA70880 (September 28, 1999); Earth Systems Pacific, Geotechnical Engineering Report San Luis Obispo County Regional Airport (SBP) Outbound Baggage Expansion, accessed February 27, 2024*	☐	☒

If the project involves land acquisition, is there a potential for this land to contain hazardous materials or containments? *Not applicable. The proposed project will be contained to land that is already part of the airport.*	☐	☐
Will the proposed project produce hazardous or solid waste either during construction or after? If yes, how will the additional waste be handled? *An estimated 100 cy of existing pavement, aggregate base, and subgrade material within the project area will be removed and hauled off-site during construction. Hazardous waste is not anticipated to be generated by the project during construction or in the long term; however, if hazardous contamination is suspected during construction (i.e., soil staining, fumes, etc.) or in the long term, the affected material will be tested for hazardous materials before being disposed of per applicable state regulations.*	☒	☐

5-2.b(13) Public Involvement	**YES**	**NO**
Was there any public notification or involvement? If yes, provide documentation.	☐	☒

Permits

List any permits required for the proposed project which have not been previously discussed. Provide details on the status of the permits.

None needed.

Environmental Commitments

List all measures and commitments made to avoid, minimize, mitigate, and compensate for impacts on the environment, which are needed for this project to qualify for a CATEX.

- *If any buried and/or previously unidentified cultural resources are encountered during the proposed project, work shall cease immediately at that location and the airport sponsor shall notify the FAA and the State Historic Preservation Office (SHPO) as soon as possible to determine the appropriate course of action.*
- *Contractors shall follow standard hazardous materials containment procedures and best management practices, should an inadvertent spill occur. If previously unknown contaminants are discovered during construction or a spill occurs during construction, work shall be halted and the National Response Center shall be notified.*
- *If hazardous contamination is suspected during construction (i.e., soil staining, fumes, etc.), the affected material will be tested for hazardous materials before being disposed of per applicable state regulations.*

Preparer Information

Point of Contact: *Alyson Hulet, Environmental Planner, Coffman Associates*		
Address: *4835 E Cactus Road, Suite 235*		
City: *Scottsdale*	**State:** *Arizona*	**Zip Code:** *85254*
Phone: *(602) 993-6999*	**Email Address:** *ahulet@coffmanassociates.com*	

Signature: Alyson Hulet Date: May 19, 2025

Airport Sponsor Information and Certification (may not be delegated to consultant)

Provide contact information for the designated sponsor point of contact and any other individuals requiring notification of the FAA decision.

Point of Contact: *Courtney M. Johnson, C.M., CAE, Airports Director*		
Address: *975 Airport Drive, Suite 1*		
City: *San Luis Obispo*	State: *California*	Zip Code: *93401*
Phone Number: *(805) 781-5218*	Email Address: *comjohnson@co.slo.ca.us*	
Additional Names:	Additional Email Address(es):	

I certify that the information I have provided above is, to the best of my knowledge, correct. I also recognize and agree that no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed project(s) until FAA issues a final environmental decision for the proposed project(s) and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval) has occurred.

Signature: Date: 27/05/25 Click or tap here to enter text.

FAA Decision

Having reviewed the above information, it is the FAA's decision that the proposed project(s) or development warrants environmental processing as indicated below.

Name of Airport, LOC ID, and Location:

San Luis Obispo County Regional Airport (SBP)
975 Airport Drive
San Luis Obispo, CA 93401

Project Title: ***Temporary Outbound Baggage Handling System Expansion***

☐ No further NEPA review required. Project is categorically excluded per (cite applicable 1050.1 (current version) and CATEX that applies): *5-6.4(h) and (o)*

☐ An Environmental Assessment (EA) is required.

☐ An Environmental Impact Statement (EIS) is required.

☐ The following additional documentation is necessary for FAA to perform a complete Environmental evaluation of the proposed project.

Name: _____ Title: _____
Responsible FAA Official

Signature: _____ Date: _____

Attachment 1

Proposed Project Exhibits

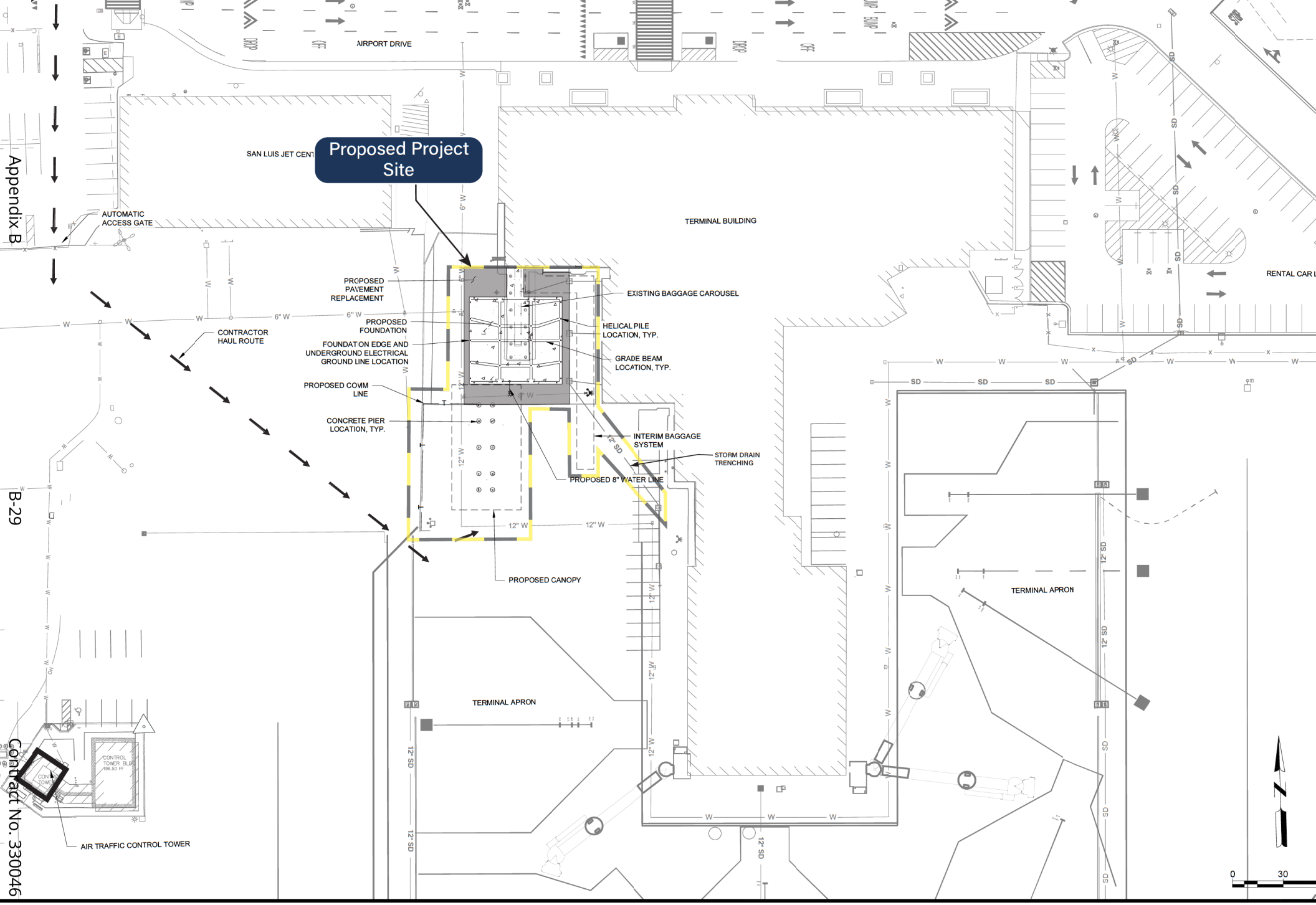

Proposed Project Site
AIRPORT DRIVE
SAN LUIS JET CENT
AUTOMATIC ACCESS GATE
CONTRACTOR HAUL ROUTE
TERMINAL BUILDING
PROPOSED PAVEMENT REPLACEMENT
PROPOSED FOUNDATION
FOUNDATION EDGE AND UNDERGROUND ELECTRICAL GROUND LINE LOCATION
PROPOSED COMM LINE
CONCRETE PIER LOCATION, TYP.
EXISTING BAGGAGE CAROUSEL
HELICAL PILE LOCATION, TYP.
GRADE BEAM LOCATION, TYP.
INTERIM BAGGAGE SYSTEM
STORM DRAIN TRENCHING
PROPOSED 8" WATER LINE
PROPOSED CANOPY
TERMINAL APRON
RENTAL CAR
CONTROL TOWER BLDG
AIR TRAFFIC CONTROL TOWER
0
30
LEGEND
CONTRACTOR HAUL ROUTE
STRUCTURE FOUNDATION
PAVEMENT REMOVAL AND REPLACEMENT



Exhibit 2
DIRECT APE

Attachment 2

Biological Information

IPaC resource list

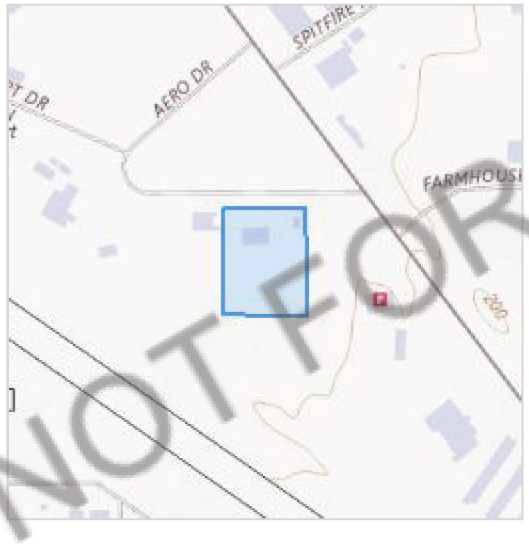
This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

San Luis Obispo County, California



Local office

Ventura Fish And Wildlife Office

(805) 644-1766
(805) 644-3958
FW8VenturaSection7@FWS.Gov

2493 Portola Road, Suite B
Ventura, CA 93003-7726

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME STATUS

NOT FOR CONSULTATION

Giant Kangaroo Rat Dipodomys ingens — Endangered

Wherever found

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/6051

Birds

NAME	STATUS

California Condor Gymnogyps californianus — Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/8193

California Least Tern Sternula antillarum browni — Endangered

Wherever found

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/8104

California Ridgway"s Rail Rallus obsoletus obsoletus — Endangered

Wherever found

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/4240

Least Bell's Vireo Vireo bellii pusillus — Endangered

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/5945

Marbled Murrelet Brachyramphus marmoratus — Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/4467

Western Snowy Plover Charadrius nivosus nivosus — Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/8035

Yellow-billed Cuckoo Coccyzus americanus — Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

https://ecos.fws.gov/ecp/species/3911

Reptiles

NOT FOR CONSULTATION

NAME	STATUS
Southwestern Pond Turtle Actinemys pallida Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4768	Proposed Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
Foothill Yellow-legged Frog Rana boylii There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5133	Endangered

Fishes

NAME	STATUS
Tidewater Goby Eucyclogobius newberryi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Crustaceans

NAME	STATUS

NOT FOR CONSULTATION

NAME	STATUS
Vernal Pool Fairy Shrimp Branchinecta lynchi Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
California Jewelflower Caulanthus californicus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4599	Endangered
Chorro Creek Bog Thistle Cirsium fontinale var. obispoense Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5991	Endangered
Gambel's Watercress Rorippa gambellii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4201	Endangered
Indian Knob Mountainbalm Eriodictyon altissimum Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1261	Endangered
Morro Manzanita Arctostaphylos morroensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2934	Threatened
Pismo Clarkia Clarkia speciosa ssp. immaculata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5936	Endangered
Salt Marsh Bird's-beak Cordylanthus maritimus ssp. maritimus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6447	Endangered

NOT FOR CONSULTATION

Spreading Navarretia	Navarretia fossalis	Threatened

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/1334

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

NOT FOR CONSULTATION

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs
The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a

level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

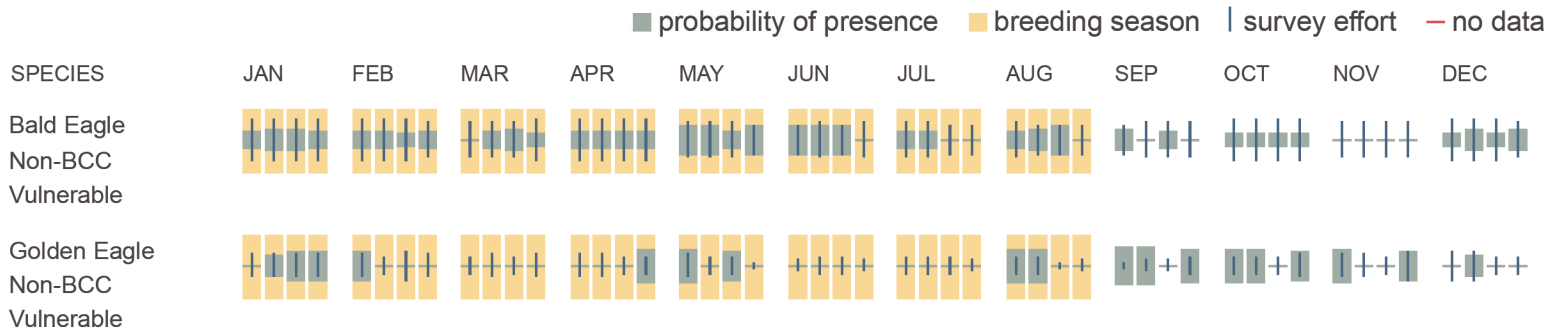
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

NOT FOR CONSULTATION



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

NOT FOR CONSULTATION

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

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Allen's Hummingbird Selasphorus sasin — Breeds Feb 1 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9637

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Belding's Savannah Sparrow Passerculus sandwichensis beldingi — Breeds Apr 1 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8

Black Swift Cypseloides niger — Breeds Jun 15 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8878

Black Turnstone Arenaria melanocephala — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Bullock's Oriole Icterus bullockii — Breeds Mar 21 to Jul 25

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Gull Larus californicus — Breeds Mar 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Clark's Grebe Aechmophorus clarkii — Breeds Jun 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

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Elegant Tern Thalasseus elegans — Breeds Apr 5 to Aug 5

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8561

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Spinus lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Marbled Godwit Limosa fedoa — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Northern Harrier Circus hudsonius — Breeds Apr 1 to Sep 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8350

Nuttall's Woodpecker Dryobates nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Santa Barbara Song Sparrow Melospiza melodia graminea — Breeds Mar 1 to Sep 5

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/5513

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Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Tricolored Blackbird Agelaius tricolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Western Grebe aechmophorus occidentalis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Western Gull Larus occidentalis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 21 to Aug 25
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit Chamaea fasciata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10
Yellow-billed Magpie Pica nuttalli This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9726	Breeds Apr 1 to Jul 31

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

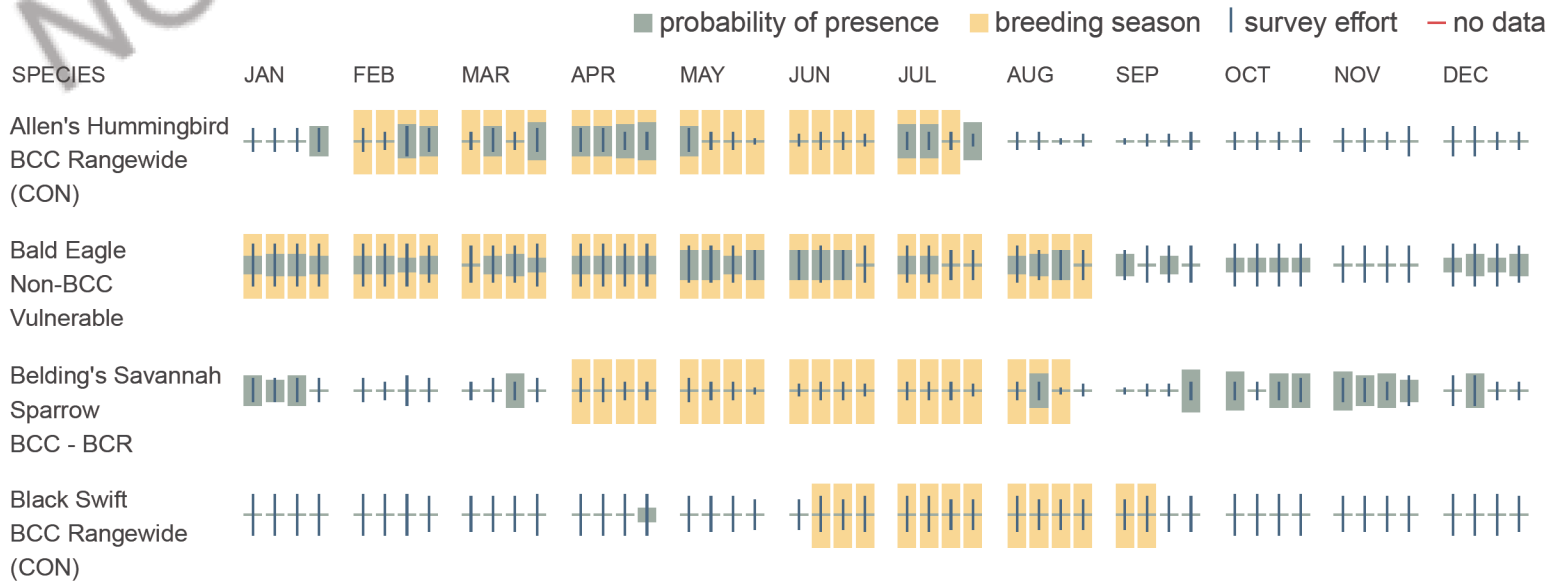
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

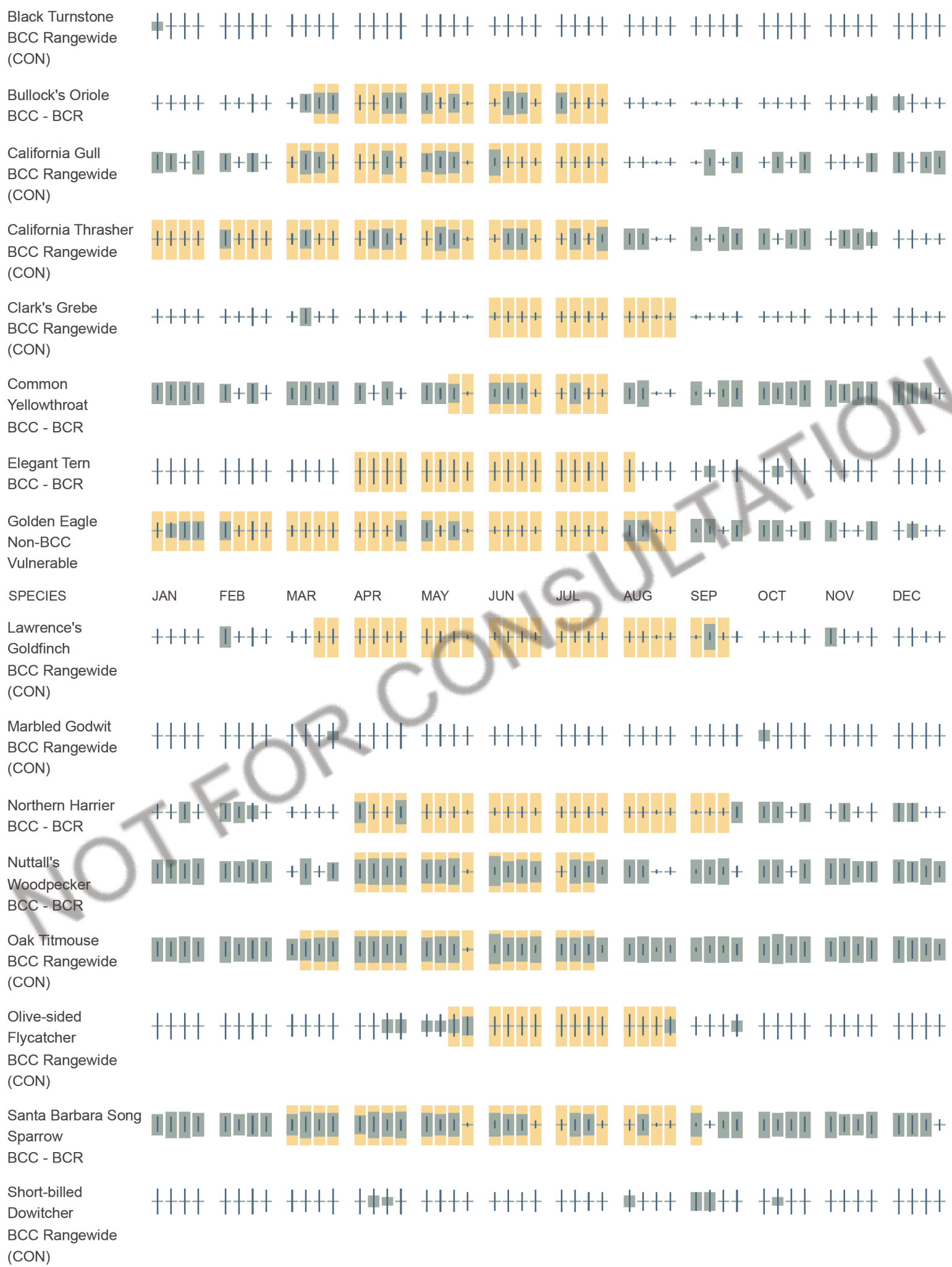
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

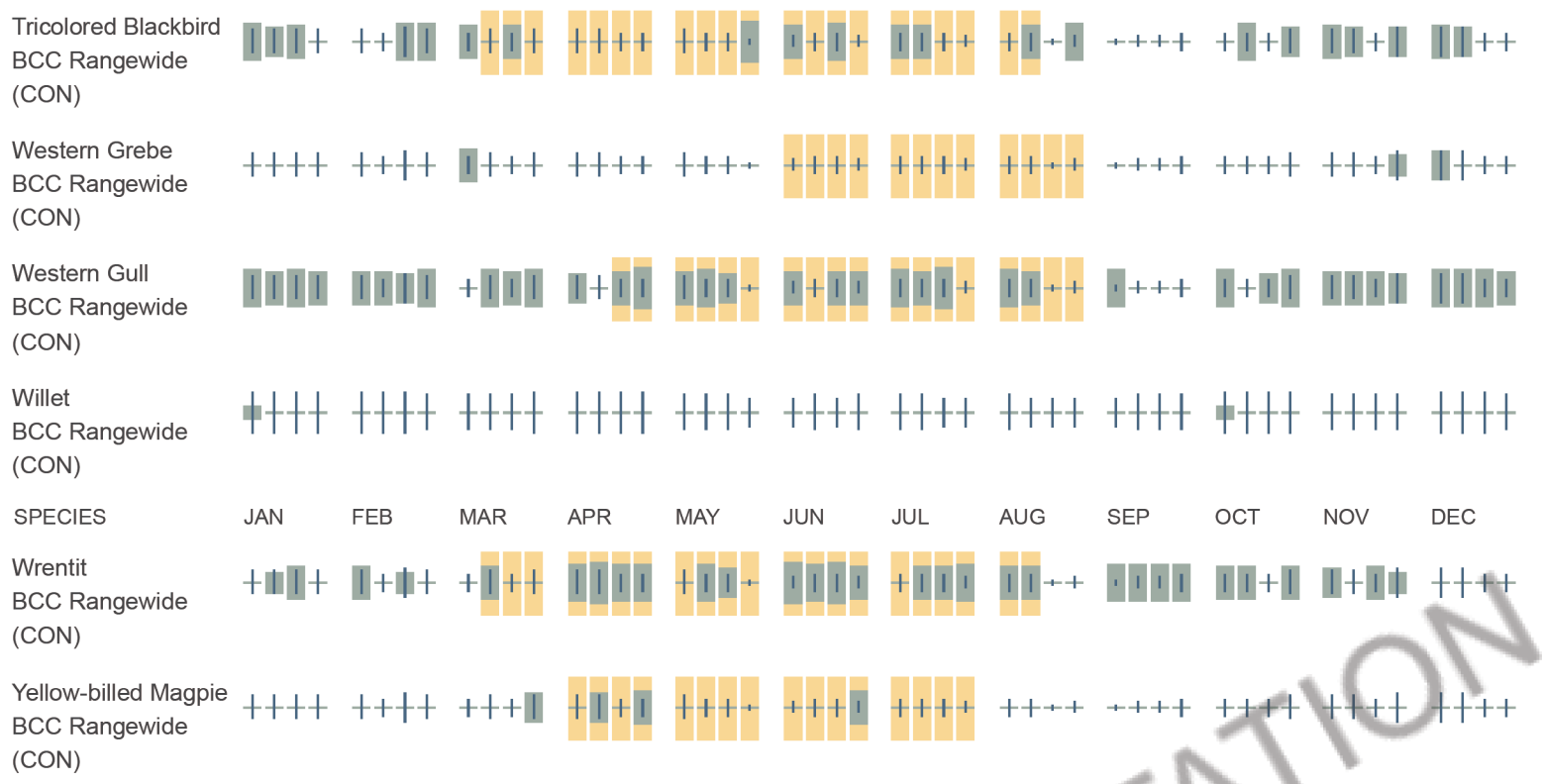
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as “Vulnerable”. See the FAQ “What are the levels of concern for migratory birds?” for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your

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project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the

local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

CBRA information is not available at this time

This can happen when the CBRS map service is unavailable, or for very large projects that intersect many coastal areas. Try again, or visit the CBRS map to view coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

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Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment 3

Water Resources

U.S. Fish and Wildlife Service
National Wetlands Inventory

SBP Wetlands Map



December 13, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

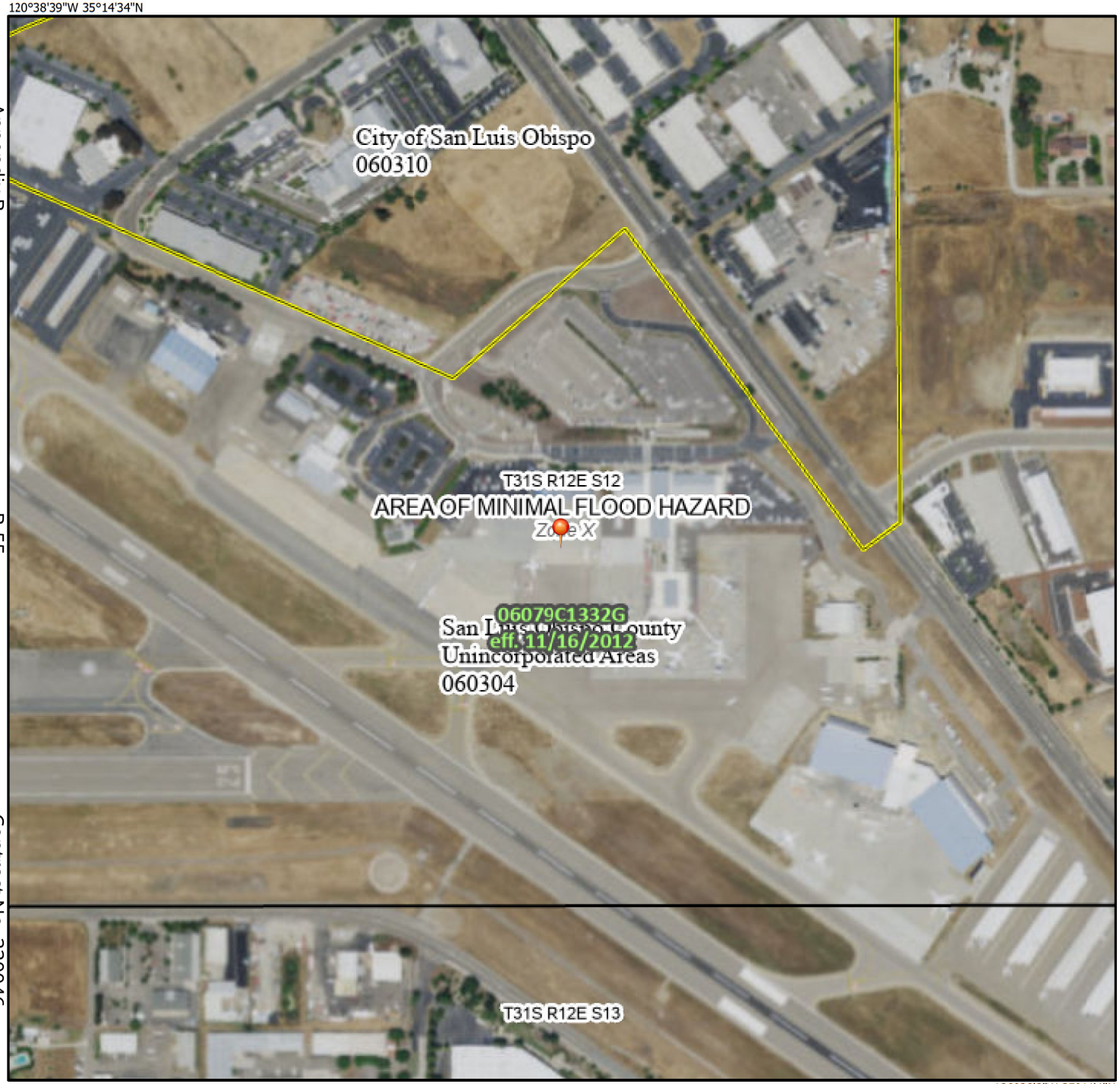
Attachment 4

Floodplains

National Flood Hazard Layer FIRMette

FEMA

120°38'39"W 35°14'34"N



120°38'2"W 35°14'4"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, A0, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/13/2023 at 11:47 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

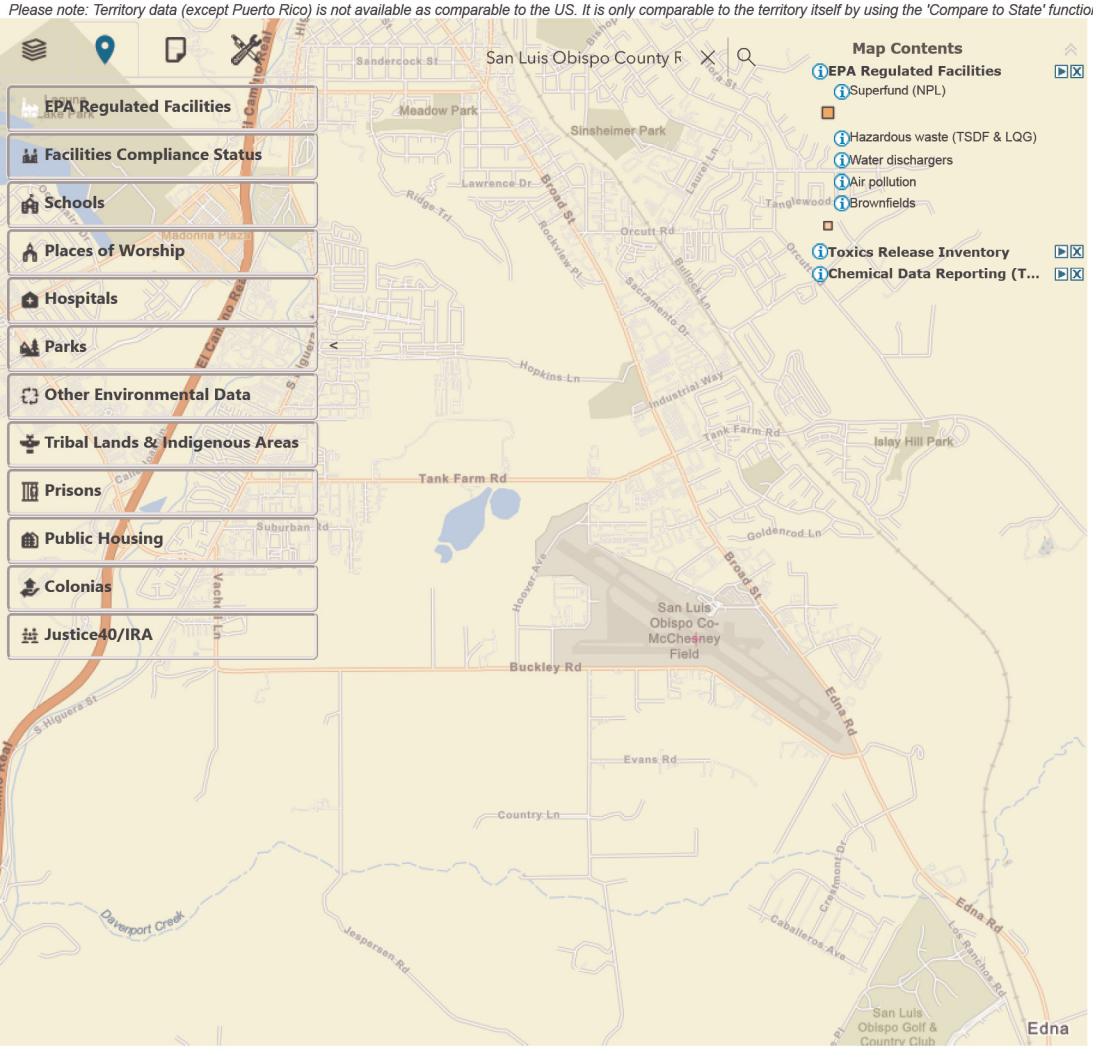
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Attachment 5

SBP Formerly Used Defense Sites Program Management Action Plan

EJScreen EPA's Environmental Justice Screening and Mapping Tool (Version 2.2) EJScreen Website (https://www.epa.gov/ejscreen) | Mobile (mobile/index.html) | Glossary (https://www.epa.gov/ejscreen/glossa

Please note: Territory data (except Puerto Rico) is not available as comparable to the US. It is only comparable to the territory itself by using the 'Compare to State' functionality. Likewise, some of the indicators may not be available for territories. X



EnviroMapper®

California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Manage… Powered by Esri (http://www.esri.com/)

US Army Corps of Engineers
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SAN LUIS OBISPO AIRPORT

Formerly Used Defense Sites Program Management Action Plan

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I. Statement of Purpose

A. Management Action Plan

The Management Action Plan (MAP) is to outline the total multi-year environmental cleanup program for a Formerly Used Defense Site (FUDS) property. The plan will define the cleanup program requirements and propose a comprehensive approach and associated costs to conduct future investigations and response action at each cleanup site.

B. Formerly Used Defense Sites Program

During the past two centuries, the Department of Defense (DOD) has used land throughout the United States to both train Soldiers, Airmen, Sailors and Marines, and test new weapons to ensure the nation's military readiness. As training and testing needs changed, DOD obtained property or returned it to private or public uses. When no longer needed, many of these properties were cleaned up according to the best practices available at the time and then transferred to other owners such as private individuals or federal, state, tribal, or local government entities.

Today, DOD is responsible for the environmental restoration (cleanup) of properties that were formerly owned by, leased to or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense prior to October 1986.Such properties are known as Formerly Used Defense Sites or FUDS. The U.S. Army is DOD's lead agent for the FUDS Program. The U.S. Army Corps of Engineers executes the FUDS Program on behalf of the U.S. Army and DOD. The U.S. Army and DOD are dedicated to protecting human health and the environment by investigating and, if required, cleaning up potential contamination or munitions that may remain on these properties from past DOD activities.

The scope and magnitude of the FUDS Program are significant, with more than 10, 000 properties identified for potential inclusion in the program. Information about the origin and extent of contamination or munitions, land transfer issues, past and present property ownership, applicable laws and DOD policies must be evaluated before DOD considers a property eligible for Defense Environment Restoration Account funding under the FUDS Program. Environmental cleanup at FUDS properties is conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

C. Installation Restoration Program (IRP)

Installation Restoration Program (IRP) category projects include sites that require response actions to address releases of: (a) Hazardous substances and pollutants or contaminants; (b) Petroleum, Oil, and Lubricants (POLs); (c) Hazardous wastes or hazardous waste constituents; and (d) Explosive compounds released to soil, surface water, sediment, or groundwater as a result of ammunition or explosives production or manufacturing at ammunition plants.

The relative risk site evaluation (RRSE) framework is a methodology used by all DoD Components to evaluate the relative risk posed by a site in relation to other sites. It is a tool used across all of DoD to group sites into high, medium, and low categories based on an evaluation of site information using three factors: the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF).Factors are based on a quantitative evaluation of Comprehensive Environmental Response, Compensation and Liability Act(CERCLA) hazardous substances, pollutants, or contaminants and a qualitative evaluation of pathways and human and ecological receptors in the four media most likely to result in significant exposure groundwater, surface water, sediment, and surface soils.

D. Military Munitions Response Program (MMRP)

In 2001, DoD established the Military Munitions Response Program (MMRP). The MMRP addresses munitions response sites (MRSs) at Formerly Used Defense Site locations. MRSs are sites that are known or suspected to contain unexploded ordnance, discarded military munitions, or munitions constituents (MC). Through the MMRP, DoD complies with environmental cleanup laws, such as the Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund.

To prioritize funding and cleanup of MRSs that pose the greatest threat to safety, human health, and the environment, DoD uses the Munitions Response Site Prioritization Protocol (MRSPP). The MRSPP consists of three separate modules to evaluate hazards associated with explosives, chemical warfare materiel, MC, and other incidental environmental contaminants. The MRSPP scores affect how DoD sequences MRSs for cleanup. In addition to relative risk, DoD considers other factors such as economic, programmatic, and stakeholder concerns, as well as reuse and redevelopment plans, when prioritizing sites for cleanup.

II: Acronyms

BD/DR	Building Demolition and Debris Removal
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHE	Chemical Warfare Material Hazard Evaluation
COMM/REL	Community Relations
CON/HTRW	Containerized/Hazardous, Toxic and Radioactive Waste
CTC	Cost to complete
CWM	Chemical Warfare Material
DD	Decision Document
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
EE/CA	Engineer Evaluation/Cost Analysis
EHE	Explosive Hazard Factor
EP	Evaluation Pending
FFA	Federal Facilities Agreement
FUDS	Formerly Used Defense Sites
FUDSMIS	Formerly Used Defense Sites Management Information System
FS	Feasibility Study
HQDA	Headquarters, Department of the Army
HHE	Health Hazard Evaluation
IAG	Interagency Agreement
IRA	Interim remedial action
IRP	Installation Restoration Program
LTM	Long Term Management
MAP	Management Action Plan
MMRP	Military Munitions Response Program
MMRP/CWM	Military Munitions Response Program/Chemical Warfare Materials
MRSPP	Military Munitions Site Prioritization Protocol
NKSH	No Known or suspected Hazard
NLR	No Longer Required
NPL	National Priorities List
PA	Preliminary Assessment
PA/INPR	Preliminary Assessment/Inventory Project Report
PCO	Project Closeout
PN	Preliminary Negotiations
QA	Quality Assurance
RA	Remedial Action
RA-C	Remedial Action-Construction
RA-O	Remedial Action-Operations
RAB	Restoration Advisory Board
RC	Response Complete

RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RmA-C	Removal Action-Construction
RmD	Removal Design
RI/FS	Remedial Investigation/Feasibility Study
RIP	Remedy in Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SI	Site Investigation
TAPP	Technical Assistance for Public Participation
TRC	Technical Review Committee

III. Property Information

FUDS Number: J09CA7088
FFID: CA99799F991000
Name: SAN LUIS OBISPO AIRPORT

A. Property Description

THE SITE SURVEY WAS COMPLETED ON FOOT AND BY CAR, WITH THE AID OF MS. JACQUELYN HULSEY, AIRPORT OPERATIONS SUPERVISOR. THE AIRPORT CURRENTLY CONSISTS OF 320 ACRES, WHICH ARE CURRENTLY IN USE AS A PRIVATE AND COMMERCIAL AIRPORT- THE PROPERTY IS OCCUPIED BY TYPICAL AIRPORT FACILITIES, INCLUDING COMMERCIAL AND PRIVATE HANGARS, PLANE SERVICE FACILITIES (E.G. A PROPELLER SERVICE COMPANY), AN AIRPORT TERMINAL, A RESTAURANT, PARKING LOTS, AND AN AIRCRAFT CONTROL TOWER. THE AREA SURROUNDING THE AIRPORT CONSISTS OF OPEN SPACE AND COMMERCIAL, INDUSTRIAL, AND RESIDENTIAL USES. THE AREA WEST OF THE AIRPORT PROPERTY IS A FORMER UNOCAL PETROLEUM BULK STORAGE FACILITY. THE TANKS HAVE BEEN REMOVED BUT THE CONTAINMENT BERMS REMAIN. THESE BERMS HAVE CREATED WETLAND AREAS. SANTA FE LEVEE ROAD TRAVERSES THE WESTERN PORTION OF THE AIRPORT PROPERTY, IN A NORTH-SOUTH DIRECTION. AN ISLAND OF PRIVATE COMMERCIAL DEVELOPMENT, SURROUNDED BY AIRPORT PROPERTY, IS LOCATED ALONG THE WESTERN SIDE OF THIS ROAD. BUCKLEY ROAD LIES ALONG THE SOUTHERN PROPERTY BOUNDARY. COMMERCIAL, INDUSTRIAL, AND RESIDENTIAL PROPERTIES ARE LOCATED ALONG THIS ROAD, ADJACENT TO THE AIRPORT. BROAD STREET LIES ALONG THE EASTERN PROPERTY BOUNDARY. COMMERCIAL AND RESIDENTIAL PROPERTIES ARE ALSO PRESENT ALONG THIS ROAD, EAST OF THE AIRPORT. A PORTION OF AIRPORT-OWNED PROPERTY, IN THE NORTHERN PART OF THE AIRPORT, IS OCCUPIED BY A OMMERCIAL/INDUSTRIAL PARK. SIMILAR PROPERTIES ARE ALSO PRESENT IN THE SURROUNDING AREA, NORTH OF THE AIRPORT PROPERTY.

B. Locale

City: SAN LUIS OBISPO
State: CA
Latitude: 35.28972222

Longitude: -120.65555556
Congressional District: 24
Size (Acreage): No acreage reported

C. Organization

Division: South Pacific Division
District: Los Angeles District
Phone: 213-452-3920

Current Owners:

Type	Name
Local	CITY CITY

D. National Priorities List Status

The National Priorities List (NPL) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.

National Priorities List (NPL) Status: Not on the NPL

E. Project Summaries

The below table outlines all projects that have been identified on this FUDS property. The table provides information on the category of project, the legal driver, the RRSE or MRSPP score that is used for prioritization, the total funding for the project, the status of work on the project, and the actual or anticipated remedy in place and response complete dates.

Project Number	Category	Name	Legal Driver	RRSE	MRSPP	Status	RIP	RC
0	PA/INPR	PA/INPR Funding				Complete		

IV. Cleanup Program Summary

A. Historic Activity

USE OF 218 ACRES OF THE SAN LUIS OBISPO COUNTY AIRPORT BY THE U.S. ARMY AIR CORPS AND THE CALIFORNIA NATIONAL GUARD WAS INITIATED IN NOVEMBER 1938. ACQUISITION RECORDS WERE NEITHER SPECIFIC NOR COMPLETE. THE ARMY AND THE NATIONAL GUARD USED THE AIRPORT AS AN AERIAL OBSERVATION TRAINING CENTER, ASSOCIATED WITH CAMP MERRIAM. IMPROVEMENTS CONSTRUCTED BY THE ARMY AIR CORPS AND NATIONAL GUARD CONSISTED OF THREE RUNWAYS, HANGARS, MECHANIC SHOPS, MESS HALLS, BARRACKS, AND A PHOTOGRAPHY STUDIO. IT IS UNCLEAR WHETHER FUEL TANKS WERE PRESENT DURING ARMY USE OF THE AIRPORT. THE ARMY AND THE NATIONAL GUARD USED THE AIRPORT UNTIL AT LEAST NOVEMBER 1941. DISPOSAL RECORDS WERE NEITHER SPECIFIC NOR COMPLETE.
ON 4 JANUARY 1943 THE NAVY LEASED 208 ACRES OF SAN LUIS OBISPO COUNTY AIRPORT FROM THE COUNTY OF SAN LUIS OBISPO. -THE NAVY USED THE AIRPORT AS AN AIR TRAINING CENTER, IN SUPPORT OF AMPHIBIOUS FORCES IN THE PACIFIC FLEET DURING WORLD WAR II. NAVY IMPROVEMENTS CONSISTED PRIMARILY OF CONSTRUCTION OF WOODEN, PREFABRICATED BUILDINGS AND SURFICIAL IMPROVEMENTS TO THE RUNWAYS AND TAXIWAYS. NO FUEL TANKS WERE PRESENT DURING NAVY USE OF THE AIRPORT. IN MAY 1946, THE NAVY DISPOSED OF THE 208 LEASED ACRES AND ABANDONED THE AIRPORT FACILITIES, LEAVING ALL IMPROVEMENTS TO THE COUNTY OF SAN LUIS OBISPO. ONE OF THE FORMER NAVY BARRACKS MAY HAVE SUBSEQUENTLY BEEN USED IN 1946 AS THE INITIAL SOUTHWEST AIRLINES OFFICE. USE OF THE AIRPORT BY THE COUNTY OF SAN LUIS OBISPO HAS CONTINUED TO THE PRESENT. WITH THE EXCEPTION OF THE RUNWAYS, IT DOES NOT APPEAR THAT ANY OF THE EXISTING IMPROVEMENTS WERE IN USE DURING ARMY, NATIONAL GUARD, OR NAVY OCCUPATION.

V. Installation Restoration Program (IRP)

A. IRP Summary

Inception of IRP: No IRPprojects have been reported
Projects Identified: 0
Projects at Response Complete: 0
Remedy-in-Place (RIP): No RIP scheduled
Response Complete (RC): No RC scheduled
IRP completion (including LTM): No IRPprojects have been reported

B. IRP Schedule

Project Schedule

There are no IRP projects on this installation.

Five-Year Review
Status: No Reviews Planned

C. Project Descriptions

Please see **Appendix I** for detailed IRP project descriptions

D. Costs

Funding To Date* ($K): $0
2021 Funding ($K): $0
CTC ($K): $0

There are no IRP project costs on this installation.
*Past costs are approximate and not inflated to reflect current year fiscal dollars.

VI. Military Munitions Response Program (MMRP)

A. MMRP Summary

Inception of MMRP: No MMRPprojects have been reported
Projects Identified: 0
Projects at Response Complete: 0
Remedy-in-Place (RIP): No RIP scheduled
Response Complete (RC): No RC scheduled
MMRP completion (including LTM): No MMRPprojects have been reported

B. MMRP Schedule

Project Schedule

There are no MMRP projects on this installation.

Five-Year Review

Status: No Reviews Planned

C. Project Descriptions

Please see **Appendix II** for detailed MMRP project descriptions

D. Costs

Funding To Date* ($K): $0
2021 Funding ($K): $0
CTC ($K): $0

There are no MMRP project costs on this installation.
*Past costs are approximate and not inflated to reflect current year fiscal dollars.

VII. Community Involvement

Since 1993, the Department of Defense (DOD) has supported the development, implementation, and maintenance of the Restoration Advisory Board (RAB) program. Through the RAB program, communities provide input into the decision - making process of DOD's environmental cleanup program. A RAB is a group, equally co - chaired by a DOD representative and a community member, that serves as a forum for exchange of information between government officials and members of the local community on property cleanup issues. In addition to regular RAB meetings, a combination of activities may be conducted to enhance this process. Such activities may include coordinating installation site tours or providing interactive presentations with the use of cleanup technology models. Members of a RAB may include local citizens and representatives of the U.S. Environmental Protection Agency (EPA) and state, local, and tribal governments. The RAB team should reflect the diverse interests of the community and help identify possible issues associated with an installation's environmental cleanup program. RABs provide a link between the community and cleanup decision makers, and should complement other community involvement activities, such as holding public meetings, distributing informative mailings to the public on installation cleanup activities, and establishing local information repositories.

In fiscal year 1998 (FY98), DOD continued to build trust with local communities surrounding military installations by strengthening the RAB program and making new resources available; including the implementation of the Technical Assistance for Public Participation (TAPP) program. The TAPP program was designed to help community members of RABs and TRCs better understand the scientific and engineering issues underlying their properties' environmental cleanup activities. Under TAPP, the installation may contract for an independent technical consultant to advise the RAB on a specific project, which must be identified in the TAPP application. Typical projects may involve reviewing proposed remedial technologies, interpreting health and environmental effects data, or reviewing cleanup documents.

No RAB has been reported

APPENDIX I
IRP Project Descriptions

There are no IRP projects on this installation.

APPENDIX II
MMRP Project Descriptions

There are no MMRP projects on this installation.

SBP Baggage Handling CatEx 051925

Final Audit Report 2025-05-27

Created:	2025-05-25
By:	Courtney Pene (cpene@co.slo.ca.us)
Status:	Signed
Transaction ID:	CBJCHBCAABAAsjo9nsfC2WC5kJD7mXvjeJ84-XSiXCqJ

"SBP Baggage Handling CatEx 051925" History

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PROJECT PLANS

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)

BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

PROJECT No.: 1943000-222814.02

SCOPE OF WORK

THE PROJECT WILL CONSIST OF A NEW OUTBOUND BAGGAGE SYSTEM LOCATED AT THE EXISTING OUTBOUND BAGGAGE AREA ON THE SOUTHWEST SIDE OF THE TERMINAL BUILDING. THIS PROJECT INCLUDE CONSTRUCTION OF A TEMPORARY OUTBOUND BAGGAGE SYSTEM. REMOVAL OF THE EXISTING OUTBOUND BAGGAGE SYSTEM, AND CONSTRUCTION OF A NEW TENSILE STRUCTURE COVERING 2,839 SF, A DETACHED METAL CANOPY COVERING AN AREA OF 3,027 SF AND NEW OUTBOUND BAGGAGE SYSTEM. THE SITE IMPROVEMENTS WILL CONSIST OF FOUNDATION EXCAVATION, PAVEMENT REMOVAL, WATER LINE INSTALLATION, COMMUNICATION LINE INSTALLATION, STORM DRAIN ADJUSTMENTS AND IMPROVEMENTS, FOUNDATION CONSTRUCTION, SITE GRADING, AND PAVEMENT CONSTRUCTION. THE TOTAL CUT VOLUME CONSISTS OF 274.94 CY AND A FILL VOLUME OF 7.78 CY. THE AREA OF DISTURBANCE IS 0.30 ACRES.

REQUIRED SPECIAL INSPECTIONS

SPECIAL INSPECTIONS FOR VERIFICATION AND INSPECTIONS OF SOILS ARE REQUIRED AS PART OF THIS PROJECT. SEE SHEET S-002 FOR THE STATEMENT OF REQUIRED SPECIAL INSPECTIONS.

VICINITY MAP



LOCAL MAP



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WDID#:_____

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LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT
1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
DO NOT SCALE DRAWINGS

SHEET CONTENTS
COVER SHEET

SHEET NO.:
G-001

1/29/2026 8:56:35 AM C:\Revit Local\222814.02-A-R24_Marek.Pinc5QXDGJ.rvt

APPLICABLE CODES AND DESIGN CRITERIA

Project Name and Location:

San Luis Obispo County Regional Airport

975 Airport Drive, Suite 1
San Luis Obispo, California 93401

Applicable Design Criteria and Codes:

Building Code / Structural Code: California Building Code 2022 (IBC 2021)
California Code of Regulations Title 24, Part 2, Volumes 1 & 2

Plumbing Code: California Plumbing Code 2022 (UPC 2021)
California Code of Regulations Title 24

Mechanical Code: California Mechanical Code 2022 (UMC 2021)
California Code of Regulations Title 24

Electrical Code: California Electrical Code 2022 (NEC 2020)
California Code of Regulations Title 24

Fire/Safety Code: California Fire Code 2022 (IFC 2021)
California Code of Regulations Title 24

Accessibility Code: California Building Code 2022 (Title 24, Part 2)
California Code of Regulations Title 24, Part 2, Volume 1

Energy Code: California Energy Code 2022 (Title 24, Part 6)
California Code of Regulations Title 24

Building Occupancy Classifications

CBC Section 303.4: Assembly, Group A-3 (Waiting Areas in transportation facilities)

CBC Section 304.1: Business, Group B (Offices, food processing establisments and commercial kitchens not associated with retaurants, cafeterias and similar dining facilities not more than 2,500 square feet in area)

CBC Section 311.1: Moderate-hazard storage, Group S-1 (Storage spaces)

Construction Type	**Climate Zone**	**Parcel # (APN)**
CBC Table 601 Type VB Sprinklered: Yes	12	059-300-025-000

FIRE PROTECTION AND LIFE SAFETY ANALYSIS

Building Area

CBC Table 506.2:

Group A-3 / VB = 24,000 SF (most restrictive)
Group B / VB = 36,000 SF
Group S-1 / VB = 36,000 SF

Group A-2 used to establish most restrictive occupancy per 508.3.2, non-separated occupancies

Allowable Area
CBC Section 506.2.4: Mixed Occupancy, Single Story Building
Aa = [At + (NS x If)]
Aa = [24,000 + (11,500 x 0)] = 24,000 SF

	Allowable Area without Frontage Increase (per story)	Actual Area (per story)
Group A-2 Total Allowable Area and Actual Area	24,000 SF	3,708 SF 2

CBC Section 506.3: Frontage increase (not taken)
P = Perimeter of entire building
F = Building perimeter that fronts the public way

CBC Section 506.3.2: Width limits (W = 30)

Allowable Building Height and Number of Stories

CBC Table 503:

Group A-3 / VB = 60 FT, 2 stories (most restrictive)
Group B / VB = 60 FT, 3 stories
Group S-1 / VB = 60 FT, 2 stories (most restrictive)

	Maximum Allowed		Actual (Existing)	
Groups A-2 & S-1	Height	Stories	Height	Stories
	60	2	25	1

Fire Resistive Requirements for Building Elements

CBC Table 601

Structural Frame:	0 hr
Bearing Walls	
Exterior:	0 hr
Interior:	0 hr
Interior Nonbearing Walls and Partitions:	0 hr
Floor Construction:	0 hr
Roof construction and secondary framing:	0 hr

Fire Resistive Requirements for Exterior Walls Based on Separation Distance

CBC Table 602
Exterior Walls where "x" is distance from fire separation
VB Construction Type, A-2 occupancy

X < 5 ft	1 hr
5 ft ≤ 10 ft	1 hr
10 ft ≤ 30 ft	0 hr
X ≥ 30 ft	0 hr

Interior Finishes: Wallls and Ceilings

CBC Table 803.13 (Building fully sprinklered)
Interior Wall and Ceiling Finish for Exit Enclosuress and Exit Passageways: Class B
Interior Wall and Ceiling Finish for Corridors: Class B
Interior Wall and Ceiling Finish for Rooms and Enclosed Spaces: Class C

Interior Finishes: Floors

CBC Section 804.4.1 with Exception (Building fully sprinklered)
Interior Floor Finish for All Floor Coverings: Class II

FIRE PROTECTION AND LIFE SAFETY ANALYSIS, CONTINUED

Occupant Load

CBC Table 1004.5
Assembly Occupancy: A-3 occupant / 100 gsf for Airport Terminal Concourse
Assembly Occupancy: A-3 occupant / 15 gsf for Waiting and Queue areas
Assembly Occupancy: A-3 occupant / 20 gsf for Baggage Claim
Business Occupancy: B occupant / 150 gsf for Administration Area
Business Occupancy: B occupant / 150 gsf for Concessions
Storage Occupancy: S-1 occupant / 300 gsf for Storage, Baggage handling and Mechanical

Function / Floor	Area	Occupants
Entire Building	10,918	210

Capacity of Means of Egress

CBC Section 1005.3.2	Stairs	Other	Total Egress Width at Grade
Exception 1	N/A	0.15 inches	
			Refer to G-021

Common Path of Travel

CBC Table 1006.2.1

Assembly Occupancy: A-3, Fully Sprinklered	75 feet

Exit Access Travel Distance

CBC Table 1017.2

Assembly Occupancy: A-3, Fully Sprinklered	250 feet

Minimum Corridor Fire Resistance Rating

CBC Table 1020.1

0 hrs (buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.

Minimum Corridor Width

CBC Section 1020.2

44 inches

Dead-end Corridor Distance

CBC Section 1020.4

Assembly Occupancy: A-3, Fully Sprinklered	20 feet

Fire Extinguishers, General

NFPA 10, CFC 906, CBC Tables 906.3(1) and 906.3(2)

Accessibility Requirements

The design for this project incorporates the accessibility requirements of CBC Chapter 11B

Plumbing Fixtures

CPC Table 422.1

Mead & Hunt

Mead & Hunt, Inc.
3110 E.Guasti Road,
Suite 330
Ontario, CA 91761
phone: 909-467-8560
meadhunt.com

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC

DO NOT SCALE DRAWINGS

SHEET CONTENTS
CODE ANALYSIS SCHEDULE

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

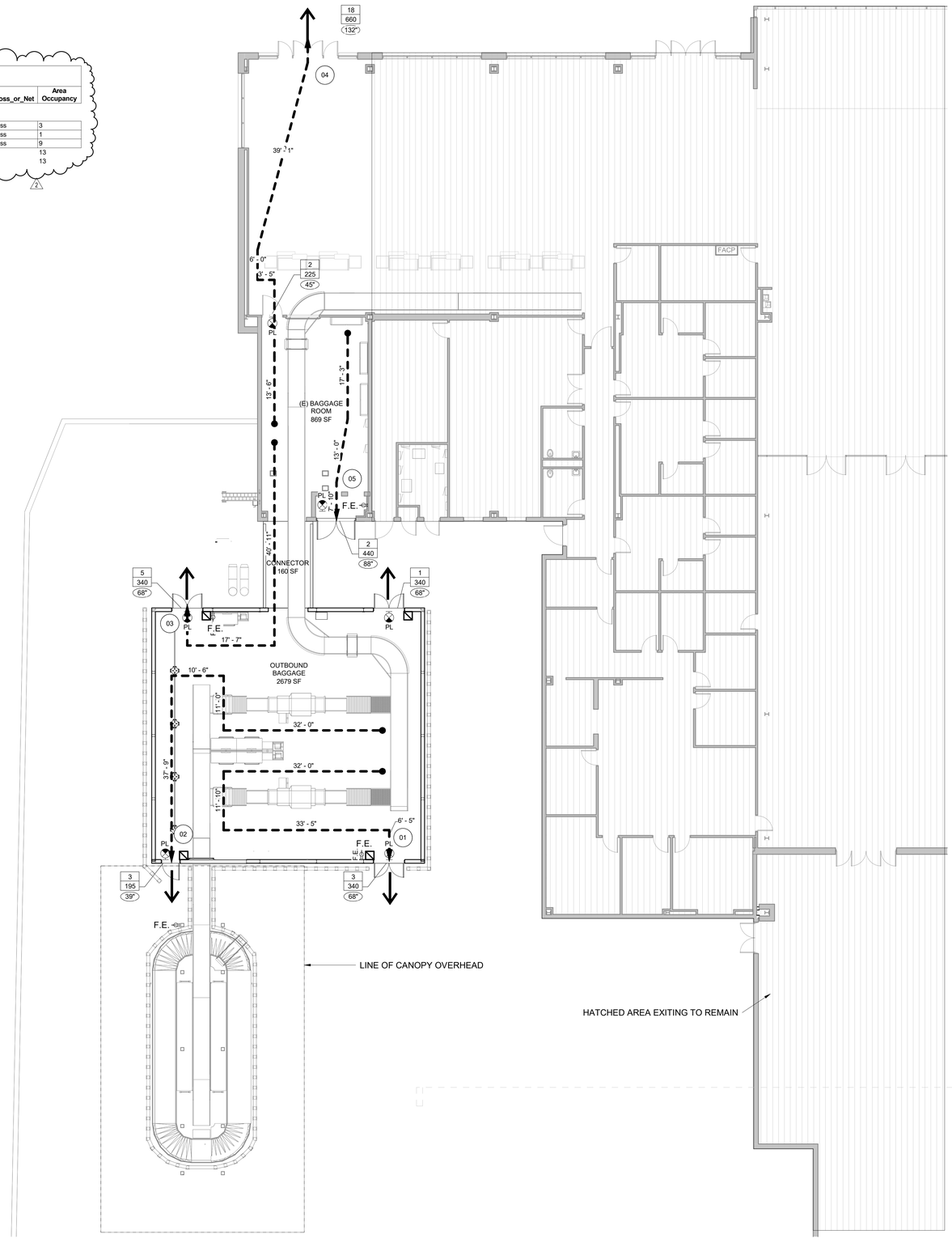
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OCCUPANT LOAD BY AREA

Area Name	Size	Function of Area	Occupant Load Factor	Gross_or_Net	Area Occupancy
Airport Terminal - Baggage handling					
(E) BAGGAGE ROOM	869 SF	Airport Terminal - Baggage handling	300	Gross	3
CONNECTOR	160 SF	Airport Terminal - Baggage handling	300	Gross	1
OUTBOUND BAGGAGE	2679 SF	Airport Terminal - Baggage handling	300	Gross	9
	3708 SF				13
Grand total	3708 SF				13

2



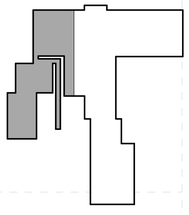
N 1 **LIFE SAFETY PLAN - AREA A**
1" = 10'-0"

LIFE SAFETY PLAN LEGEND:

- 0 / 0" / 00" — EXITING OCCUPANTS; EXIT CAPACITY REQUIRED; CLEAR WIDTH PROVIDED
- EXIT SIGN
- EXIT DISCHARGE
- 0.5-HR FIRE BARRIER
- 1-HR FIRE BARRIER
- 2-HR FIRE BARRIER
- FACP — FIRE ALARM/MNS CONTROL PANEL
- F.E. — FIRE EXTINGUISHER - WALL MOUNTED (4A - [10LB] - TYPE ABC)
- F.E.C — FIRE EXTINGUISHER - SEMI-RECESSED CABINET (4A - [10LB] - TYPE ABC)
- XX — EXIT ROUTE NUMBER
- X'-X" — SEGMENT DISTANCE

EGRESS DATA

EXIT ROUTE	DISTANCE
EXIT ROUTE #01	83' - 8"
EXIT ROUTE #02	91' - 3"
EXIT ROUTE #03	66' - 10"
EXIT ROUTE #04	83' - 0"
EXIT ROUTE #05	38' - 1"



KEY PLAN

Mead & Hunt
Mead & Hunt, Inc.
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Suite 330
Ontario, CA 91761
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LIFE SAFETY PLAN

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RENEWAL DATE
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SHEET NO.:
G-021

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2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY

CHAPTER 3
GREEN BUILDING
SECTION 301 GENERAL

301.1 SCOPE. Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

301.3 NONRESIDENTIAL ADDITIONS AND ALTERATIONS. [BSC-CG] The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of $200,000 or above (for occupancies within the authority of California Building Standards Commission). Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and/or alterations [A]. When the code section applies to both, no banner will be used.

301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:

Note: On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 *et seq.* for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.

301.3.2 Waste Diversion. The requirements of Section 5.408 shall be required for additions and alterations whenever a permit is required for work.

301.4 PUBLIC SCHOOLS AND COMMUNITY COLLEGES. (see GBSC)
301.5 HEALTH FACILITIES. (see GBSC)

SECTION 302 MIXED OCCUPANCY BUILDINGS

302.1 MIXED OCCUPANCY BUILDINGS. In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.

SECTION 303 PHASED PROJECTS

303.1 PHASED PROJECTS. For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

303.1.1 Initial Tenant improvements. The provisions of this code shall apply only to the initial tenant improvements to a project. Subsequent tenant improvements shall comply with the scoping provisions in Section 301.3 non-residential additions and alterations.

ABBREVIATION DEFINITIONS:

HCD	Department of Housing and Community Development
BSC	California Building Standards Commission
DSA-SS	Division of the State Architect, Structural Safety
OSHPD	Office of Statewide Health Planning and Development
LR	Low Rise
HR	High Rise
AA	Additions and Alterations
N	New

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES
DIVISION 5.1 PLANNING AND DESIGN

SECTION 5.101 GENERAL
5.101.1 SCOPE
The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

SECTION 5.102 DEFINITIONS
5.102.1 DEFINITIONS
The following terms are defined in Chapter 2 *(and are included here for reference)*

CUTOFF LUMINAIRES. Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.
Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), enhanced advanced technology PZEV (enhanced AT ZEV) or transitional zero emission vehicles (TZEV) regulated under CCR, Title 13, Section 1962.
2. High-efficiency vehicles, regulated by U.S. EPA, bearing a fuel economy and greenhouse gas rating od 9 oe 10 as regulated under 40 CFR Section 600 Subpart D.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV). A motor vehicle that meets the definition of "low-speed vehicle" either in Section 385.5 of the Vehicle Code or in 49CFR571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

TENANT-OCCUPANTS. Building occupants who inhabit a building during its normal hours of operation as permanent occupants, such as employees, as distinguished from customers and other transient visitors.

VANPOOL VEHICLE. Eligible vehicles are limited to any motor vehicle, other than a motortruck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purpose of ridesharing.

Note: Source: Vehicle Code, Division 1, Section 668

ZEV. Any vehicle certified to zero-emission standards.

SECTION 5.106 SITE DEVELOPMENT
5.106.1 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB LESS THAN ONE ACRE OF LAND. Newly constructed projects and additions which disturb less than one acre of land, and are not part of a larger common plan of development or sale, shall prevent the pollution of storm water runoff from the construction activities through one or more of the following measures:

5.106.1.1 Local ordinance. Comply with a lawfully enacted storm water management and/or erosion control ordinance.

5.106.1.2 Best Management Practices (BMPs). Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMPs.

1. Soil loss BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Scheduling construction activity during dry weather, when possible.
   b. Preservation of natural features, vegetation, soil, and buffers around surface waters.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils.
   e. Erosion control to protect slopes.
   f. Protection of storm drain inlets (gravel bags or catch basin inserts).
   g. Perimeter sediment control (perimeter silt fence, fiber rolls).
   h. Sediment trap or sediment basin to retain sediment on site.
   i. Stabilized construction exits.
   j. Wind erosion control.
   k. Other soil loss BMPs acceptable to the enforcing agency.
2. Good housekeeping BMPs to manage construction equipment, materials, non-stormwater discharges and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
   a. Dewatering activities.
   b. Material handling and waste management.
   c. Building materials stockpile management.
   d. Management of washout areas (concrete, paints, stucco, etc.).
   e. Control of vehicle/equipment fueling to contractor's staging area.
   f. Vehicle and equipment cleaning performed off site.
   g Spill prevention and control.
   h. Other housekeeping BMPs acceptable to the enforcing agency.

5.106.2 STORMWATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB ONE OR MORE ACRES OF LAND. Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development sale.

Note: Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of the larger common plan of development or sale must comply with the post-construction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).

The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conversation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency.

Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

5.106.4 BICYCLE PARKING. For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2

5.106.4.1 Bicycle parking. [BSC-CG] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

5.106.4.1.1 Short-term bicycle parking. If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.
Exception: Additions or alterations which add nine or less visitor vehicular parking spaces.

5.106.4.1.2 Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.3 For additions or alterations that add 10 or more tenant-occupant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility.

5.106.4.1.4 For new shell buildings in phased projects provide secure bicycle parking for 5 percent of the anticipated tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

5.106.4.1.5 Acceptable bicycle parking facility for Sections 5.106.4.1.2, 5.106.4.1.3, and 5.106.4.1.4 shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

Note: Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

5.106.4.2 Bicycle parking. [DSA-SS] For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2.

5.106.4.2.1 Student bicycle parking. Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building.
5.106.4.2.2 Staff bicycle parking. Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

5.106.5.3 Electric vehicle (EV) charging. [N] Construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3.1 and shall be provided in accordance with regulations in the California Building Code and the California Electrical Code.

Exceptions:

1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcement agency substantiating the local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.
2. Parking spaces accessible only by automated mechanical car parking systems are not required to comply with this code section

5.106.5.3.1 EV capable spaces.
[N] EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements:

1. Raceways complying with the California Electrical Code and no less that 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the EV capable and into a suitable listed cabinet, box,enclosure or equivalent. A common raceway may be used to serve multiple EV charging spaces.
2. A service panel or subpanel (s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.
4. The service panel or subpanel circuit directory shall identify the reserved overcurrent protective devices space(s) as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."

Note: A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by an enforcement agency. See vehicle Code Section 22511.2 for further details.

TABLE 5.106.5.3.1

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE)[1,2]
0-9	0	0
10-25	2	0
26-50	8	2
51-75	13	3
76-100	17	4
101-150	25	6
151-200	35	9
201 AND OVER	20% of total[1]	25% of EV capable spaces[1]

1. Where there is insufficient electrical supply.
2. The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count towards the total number of required EV capable spaces shown in column 2.

5.106.5.3.2 Electric vehicle charging stations (EVCS)
EV capable spaces shall be provided with EVSE to create EVCS in the number indicated in Table 5.106.5.3.1. The EVCS required by Table 5.106.5.3.1 may be provided with EVSE in any combination of Level 2 and Direct Current Fast Charging (DCFC), except that at least one Level 2 EVSE shall be provided.

One EV charger with multiple connectors capable of charging multiple EVs simultaneously shall be permitted if the electrical load capacity required by Section 5.106.5.3.1 for each EV capable space is accumulatively supplied to the EV charger.

The installation of each DCFC EVSE shall be permitted to reduce the minimum number of required EV capable spaces without EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.

5.106.5.3.3 Use of automatic load management systems (ALMS).
ALMS shall be permitted for EVCS. When ALMS is installed, the required electrical load capacity specified in Section
5.106.5.3.1 for each EVCS may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs.

5.106.5.3.4 Accessible EVCS.
When EVSE is installed, accessible EVSC shall be provided in accordance with the *California Building Code*, Chapter 11B, Section 11B-228.3.
Note: For EVCS signs, refer to Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

5.106.5.4 Electric Vehicle (EV) charging: medium-duty and heavy-duty. [N]
Construction shall comply with section 5.106.5.4.1 to facilitate future installation of electric vehicle supply equipment (EVSE). Construction for warehouses, grocery stores and retail stores with planned off-street loading spaces shall also comply with Section 5.106.5.4.1 for future installation of medium- and heavy-duty EVSE.
Exceptions:

1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
   a. Where there is no local utility power supply.
   b. Where the local utility is unable to supply adequate power.
   c. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the *California Electrical Code* and as follows:

5.106.5.4.1 Electric vehicle charging readiness requirements for warehouse, grocery stores and retail stores with planned off-street loading spaces.
[N] In order to avoid future demolition when adding EV charging supply and distribution equipment, spare raceways(s) or busway(s) and adequate capacity for transformers(s), service panels(s) or subpanel(s) shall be installed at the time of construction in accordance with the California Electrical Code. Construction plans and specifications shall include but are not limited to, the following:

1. The transformer, main service equipment and subpanel shall meet the minimum power requirement in Table 5.106.5.4.1 to accommodate the dedicated branch circuits for the future installation of EVSE.
2. The construction documents shall indicate on or more location(s) convenient to the planned offstreet loading space(s) reserved for medium-and heavy-duty ZEV charging cabinets and charging dispensers, and a pathway reserved for routing of conduit from the termination of the raceway(s) or busway(s) to the charging cabinet(s) and dispenser(s) as shown in Table 5.106.5.4.1
3. Raceway(s) or busway(s) originating at a main service panel or a subpanel(s) serving the area where potential future medium-and heavy-duty EVSE will be located and shall terminate in close proximity to the potential future location of the charging equipments for medium- and heavy-duty vehicles.
4. The raceway(s) or busway(s) shall be sufficient size to carry the minimum additional system load to the future location of the charging for medium- and heavy-duty ZEVs as shown in Table 5.106.5.4.1.

TABLE 5.106.5.4.1 RACEWAY CONDUIT AND PANEL POWER REQUIREMENTS FOR MEDIUM- AND HEAVY-DUTY EVSE [N]

BUILDING TYPE	BUILDING SIZE (SQ. FT.)	NUMBER OF OFF-STREET LOADING SPACES	ADDITIONAL CAPACITY REQUIRED (KVA) FOR RACEWAY & BUSWAY AND TRANSFORMER & PANEL
Grocery	10,000 to 90,000	1 or 2	200
		3 or Greater	400
	Greater than 90,000	1 or Greater	400
Retail	10,000 to 135,000	1 or 2	200
		3 or Greater	400
	Greater than 135,000	1 or Greater	400
Warehouse	20,000 to 256,000	1 or 2	200
		3 or Greater	400
	Greater than 256,000	1 or Greater	400

5.106.8 LIGHT POLLUTION REDUCTION. [N]. I Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the California Energy Code for Lighting Zones 0-4 as defined in Chapter 10, Section 10-114 of the California Administrative Code; and
2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in Chapter 8);
3. Uplight and Glare ratings as defined in California Energy Code (shown in Tables 130.2-A and 130.2-B in Chapter 8) and
4. Allowable BUG ratings not exceeding those shown in Table 5.106.8, [N] or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

Exceptions: [N]

1. Luminaires that qualify as exceptions in Sections 130.2 (b) and 140.7 of the California Energy Code.
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.
5. Luminaires with less than 6,200 initial luminaire lumens.

TABLE 5.106.8 [N] MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
MAXIMUM ALLOWABLE BACKLIGHT RATING [3]					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1-2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5-1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
MAXIMUM ALLOWABLE UPLIGHT RATING (U)					
For area lighting [3]	N/A	U0	U0	U0	U0
For all other outdoor lighting,including decorative luminaires	N/A	U1	U2	U3	UR
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**					
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**	N/A	G1	G2	G3	G4
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**	N/A	G0	G1	G1	G2
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**	N/A	G0	G0	G1	G1
MAXIMUM ALLOWABLE GLARE RATING [3] **(G)**	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.

2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.

3. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaries located in these areas shall meet *U*-value limits for "all other outdoor lighting"

5.106.8.1 Facing- Backlight
Luminaries within 2MH of a property line shall be oriented so that the nearest property line is behind the fixture, and shall comply with the backlight rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point of that property line.
Exception: Corners. If two property lines (or two segments of the same property line) have equidistant point to the luminaire, then the luminaire may be oriented so that the intersection of the two lines (the corner) is directly behind the luminaire. The luminaire shall still use the distance to the nearest points(s) on the property lines to determine the required backlight rating.

5.106.8.2 Facing-Glare.
For luminaires covered by 5.106.8.1, if a property line also exists within or extends into the front hemisphere within 2MH of the luminaire then the luminaire shall comply with the more stringent glare rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point on the nearest property line within the front hemisphere.

Note: [N]
1.See also *California Building Code*, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.
2.Refer to Chapter 8 (Compliance Forms, Worksheets and Reference Material) for IES TM-15-11 Table A-1, *California Energy Code* Tables 130.2-A and 130.2-B.
3. Refer to the *California Building Code* for requirements for additions and alterations.

5.106.10 GRADING AND PAVING. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales.
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.
Exception: Additions and alterations not altering the drainage path.

5.106.12 SHADE TREES [DSA-SS]. Shade Trees shall be planted to comply with Sections 5.106.12.1, 5.106.12.2, and 5.106.12.3. Percentages shown shall be measured at noon on the summer solstice. Landscape irrigation necessary to establish and maintain tree health shall comply with Section 5.304.6.

5.106.12.1 Surface parking areas. Shade tree plantings, minimum #10 container size or equal, shall be installed to provide shade over 50 percent of the parking area within 15 years.

Exceptions: Surface parking area covered by solar photovoltaic shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5 shall be permitted in whole or in part in lieu of shade tree planting.

5.106.12.2 Landscape areas. Shade tress plantings, minimum #10 container size or equal shall be installed to provide shade of 20% of the landscape area within 15 years.

Exceptions: Playfields for organized sport activity are not included in the total area calculation.

5.106.12.3. Hardscape areas. Shade tree plantings, minimum #10 container size or equal shall be installed to provide shade over 20 percent of the hardscape area within 15 years.

Exceptions:
1. Walks, hardscape areas covered by solar photovoltaic shade structures or shade structures with roofing materials that comply with Table A5.106.11.2.2 in Appendix A5 shall be permitted in whole or in part in lieu of shade tree planting.
2. Designated and marked play areas of organized sport activity are not included in the total area calculation.

DIVISION 5.2 ENERGY EFFICIENCY

SECTION 5.201 GENERAL
5.201.1 Scope [BSC-CG]. *California Energy Code [DSA-SS].* For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

DIVISION 5.3 WATER EFFICIENCY AND CONSERVATION

SECTION 5.301 GENERAL
5.301.1 Scope. The provisions of this chapter shall establish the means of conserving water use indoors, outdoors and in wastewater conveyance.

SECTION 5.302 DEFINITIONS
5.302.1 Definitions. The following terms are defined in Chapter 2 *(and are included here for reference)*

EVAPOTRANSPIRATION ADJUSTMENT FACTOR (ETAF) [DSA-SS]. An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency, which ae two major influences on the amount of water that needs to be applied to the landscape.

FOOTPRINT AREA [DSA-SS]. The total area of the furthest exterior wall of the structure projected to natural grade, not including exterior areas such as stairs, covered walkways, patios and decks.

METERING FAUCET. A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

GRAYWATER. Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes, but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines and laundry tubs, but does not include waste water from kitchen sinks or dishwashers.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). The California ordinance regulating landscape design, installation and maintenance practices that will ensure commercial, multifamily and other developer installed landscapes greater than 2500 square feet meet an irrigation water budget developed based on landscaped area and climatological parameters.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO). [HCD] The California model ordinance (California Code of Regulations, Title 23, Division 2, Chapter 2.7), regulating landscape design, installation and maintenance practices. Local agencies are required to adopt the updated MWELO, or adopt a local ordinance at least as effective as the MWELO.

POTABLE WATER. Water that is drinkable and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards. See definition in the California Plumbing Code, Part 5.

POTABLE WATER. [HCD] Water that is satisfactory for drinking, culinary, and domestic purposes, and meets the U.S. Environmental Protection Agency (EPA) Drinking Water Standards and the requirements of the Health Authority Having Jurisdiction.

RECYCLED WATER. Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur [Water Code Section 13050 (n)]. Simply put, recycled water is water treated to remove waste matter attaining a quality that is suitable to use the water again.

SUBMETER. [HCD 1] A secondary device beyond a meter that measures water consumption of an individual rental unit within a multiunit residential structure or mixed-use residential and commercial structure. (See Civic Code Section 1954.202 (g) and Water code Section 517 for additional details.)

WATER BUDGET. Is the estimated total landscape irrigation water use which shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Efficient Landscape Ordinance (MWELO).

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT
1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
CAL GREEN CHECKLIST

SHEET NO.:
G-031

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
EXPIRATION/RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

1/21/2026 2:58:01 PM C:\Revit Local\222814.02-A-R24_Marco.Pinci\CQ2GU.rvt

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

NONRESIDENTIAL MANDATORY MEASURES, SHEET 2 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY

SECTION 5.303 INDOOR WATER USE

5.303.1 METERS. Separate submeters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

5.303.1.1 Buildings in excess of 50,000 square feet. Separate submeters shall be installed as follows:

1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day (380 L/day), including, but not limited to, spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop.
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems:
   a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).
   b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).
   c. Steam and hot water boilers with energy input more than 500,000 Btu/h (147 kW).

5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day.

5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:

5.303.3.1 Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-Type toilets.

Note: The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

5.303.3.2 Urinals.
5.303.3.2.1 Wall-mounted Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush.

5.303.3.2.2 Floor-mounted Urinals. The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush.

5.303.3.3 Showerheads. [BSC-CG]
5.303.3.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all the showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.
Note: A hand-held shower shall be considered a showerhead.

5.303.3.4 Faucets and fountains.

5.303.3.4.1 Nonresidential Lavatory faucets. Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.

5.303.3.4.2 Kitchen faucets. Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.

5.303.3.4.3 Wash fountains. Wash fountains shall have a maximum flow rate of not more than1.8 gallons per minute/20 [rim space (inches) at 60 psi].

5.303.3.4.4 Metering faucets. Metering faucets shall not deliver more than 0.20 gallons per cycle.

5.303.3.4.5 Metering faucets for wash fountains. Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per minute/20 [rim space (inches) at 60 psi].

Note: Where complying faucets are unavailable, aerators or other means may be used to achieve reduction.

5.303.3.4.6 Pre-rinse spray value
When installed, shall meet the requirements in the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations), Section 1605.1 (h)(4) Table H-2, Section 1605.3 (h)(4)(A), and Section 1607 (d)(7), and shall be equipped with an integral automatic shutoff.

FOR REFERENCE ONLY: The following table and code section have been reprinted from the *California Code of Regulations*, Title 20 (Appliance Efficiency Regulations), Section 1605.1 (h)(4) and Section 1605.3 (h)(4)(A).

TABLE H-2

STANDARDS FOR COMMERCIAL PRE-RINSE SPRAY VALUES MANUFACTURED ON OR AFTER JANUARY 28, 2019

PRODUCT CLASS [spray force in ounce force (ozf)]	MAXIMUM FLOW RATE (gpm)
Product Class 1 (≤ 5.0 ozf)	1.00
Product Class 2 (> 5.0 ozf and ≤ 8.0 ozf)	1.20
Product Class 3 (> 8.0 ozf)	1.28

5.303.4 COMMERCIAL KITCHEN EQUIPMENT.

5.303.4.1 Food Waste Disposers. Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water.
Note: This code section does not affect local jurisdiction authority to prohibit or require disposer installation.

5.303.5 AREAS OF ADDITION OR ALTERATION. For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.

5.303.6 STANDARDS FOR PLUMBING FIXTURES AND FITTINGS. Plumbing fixtures and fittings shall be installed in accordance with the *California Plumbing Code*, and shall meet the applicable standards referenced in Table 1701.1 of the *California Plumbing Code* and in Chapter 6 of this code.

SECTION 5.304 OUTDOOR WATER USE

5.304.1 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.

Notes:
1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the California Code of Regulations, Title 23, Chapter 2.7, Division 2.
2. MWELO and supporting documents, including a water budget calculator, are available at: https://www.water.ca.gov/.

5.304.6 OUTDOOR POTABLE WATER USE IN LANDSCAPE AREAS. For public schools and community colleges, landscape projects as described in Sections 5.304.6.1 and 5.304.6.2 shall comply with the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, *California Code of Regulations*, except that the evapotranspiration adjustment factor (ETAF) shall be 0.65 with an additional water allowance for special landscape areas (SLA) of 0.35.

Exception: Any project with an aggregate landscape area of 2,500 square feet or less may comply with the prescriptive measures contained in Appendix D of the MWELO.

5.304.6.1 Newly constructed landscapes. New construction projects with an aggregate landscape area equal to or greater than 500 square feet.

5.304.6.2 Rehabilitated landscapes. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,200 square feet.

DIVISION 5.4 MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 5.401 GENERAL

5.401.1 SCOPE. The provisions of this chapter shall outline means of achieving material conservation and resource efficiency through protection of buildings from exterior moisture, construction waste diversion, employment of techniques to reduce pollution through recycling of materials, and building commissioning or testing and adjusting.

SECTION 5.402 DEFINITIONS

5.402.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ADJUST. To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

BALANCE. To proportion flows within the distribution system, including sub-mains, branches and terminals, according to design quantities.

BUILDING COMMISSIONING. A systematic quality assurance process that spans the entire design and construction process, including verifying and documenting that building systems and components are planned, designed, installed, tested, operated and maintained to meet the owner's project requirements.

ORGANIC WASTE. Food waste, green waste, landscape and pruning wste, nonhazardous wood waste, and food soiled paper waste that is mixed in with food waste.

TEST. A procedure to determine quantitative performance of a system or equipment

SECTION 5.407 WATER RESISTANCE AND MOISTURE MANAGEMENT

5.407.1 WEATHER PROTECTION. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1402.2 (Weather Protection), manufacturer's installation instructions or local ordinance, whichever is more stringent.

5.407.2 MOISTURE CONTROL. Employ moisture control measures by the following methods.

5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent spray on structures.

5.407.2.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings as follows:

5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following:

1. An installed awning at least 4 feet in depth.
2. The door is protected by a roof overhang at least 4 feet in depth.
3. The door is recessed at least 4 feet.
4. Other methods which provide equivalent protection.

5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.

SECTION 5.408 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 CONSTRUCTION WASTE MANAGEMENT. Recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction and demolition waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan that:

1. Identifies the construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determines if construction and demolition waste materials will be sorted on-site (source-separated) or bulk mixed (single stream).
3. Identifies diversion facilities where construction and demolition waste material collected will be taken.
4. Specifies that the amount of construction and demolition waste materials diverted shall be calculated by weight or volume, but not by both.

5.408.1.2 Waste Management Company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with this section.

Note: The owner or contractor shall make the determination if the construction and demolition waste material will be diverted by a waste management company.

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets.

5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65% minimum requirement as approved by the enforcing agency.

5.408.1.4 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Sections 5.408.1.1, through 5.408.1.3. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

Notes:

1. Sample forms found in "A Guide to the California Green Building Standards Code (Nonresidential)" located www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

5.408.2 UNIVERSAL WASTE. [A] Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.

Note: Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/universalwaste/

5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

Exception: Reuse, either on or off-site, of vegetation or soil contaminated by disease or pest infestation.

Notes:

1. If contamination by disease or pest infestation is suspected, contact the County Agricultural Commissioner and follow its direction for recycling or disposal of the material.
2. For a map of know pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (www.cdfa.ca.gov)

SECTION 5.410 BUILDING MAINTENANCE AND OPERATIONS

5.410.1 RECYCLING BY OCCUPANTS. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

Exception: Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.

5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30% or more in floor area, shall provide recycling areas on site.

Exception: Additions within a tenant space resulting in less than a 30% increase in the tenant space floor area.

5.410.1.2 Sample ordinance. Space allocation for recycling areas shall comply with Chapter 18, Part 3, Division 30 of the *Public Resources Code*. Chapter 18 is known as the California Solid Waste Reuse and Recycling Access Act of 1991 (Act).

Note: A sample ordinance for use by local agencies may be found in Appendix A of the document at the CalRecycle's web site.

5.410.2 COMMISSIONING. [N] New buildings 10,000 square feet and over. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated y the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements

Commissioning requirements shall include:

1. Owner's or Owner representative's project requirements.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.
6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

Note: For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and or air conditioning.

Informational Notes:

1. IAS AC 476 is an accreditation criteria for organizations providing training and/or certification of commissioning personnel. AC 476 is available to the Authority Having Jurisdiction as a reference for qualifications of commissioning personnel. AC 476 des not certify individuals to conduct functional performance tests or to adjust and balance systems.
2. Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

5.410.2.1 Owner's or Owner Representative's Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:
1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse system.

5.410.2.3 Commissioning plan. [N] Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:
1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
   a. An explanation of the original design intent.
   b. Equipment and systems to be tested, including the extent of tests.
   c. Functions to be tested.
   d. Conditions under which the test shall be performed.
   e. Measurable criteria for acceptable performance.
4. Commissioning team information.
5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

5.410.2.4 Functional performance testing. [N] Functional performance tests shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.

5.410.2.5 Documentation and training. [N] A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in *California Code of Regulations* (CCR), Title 8, Section 5142, and other related regulations.

5.410.2.5.1 Systems manual. [N] Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner or representative. The systems manual shall include the following:
1. Site information, including facility description, history and current requirements.
2. Site contact information.
3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.
4. Major systems.
5. Site equipment inventory and maintenance notes.
6. A copy of verifications required by the enforcing agency or this code.
7. Other resources and documentation, if applicable.

5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following:
1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the Systems Manual.
4. Review of the record drawings on the system/equipment.

5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.

5.410.4 TESTING AND ADJUSTING. New buildings less than 10,000 square feet. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

5.410.4.2 (Reserved)

Note: For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting system and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements and Sections 120.5, 120.6, 130.4, and 140.9(b)3 for additional testing requirements of specific systems.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; Associated Air Balance Council National Standards or as approved by the enforcing agency.

5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 Operation and maintenance (O & M) manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O & M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.

DIVISION 5.5 ENVIRONMENTAL QUALITY

SECTION 5.501 GENERAL

5.501.1 SCOPE. The provisions of this chapter shall outline means of reducing the quantity of air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of a building's installers, occupants and neighbors.

SECTION 5.502 DEFINITIONS

5.502.1 DEFINITIONS. The following terms are defined in Chapter 2 *(and are included here for reference)*

ARTERIAL HIGHWAY. A general term denoting a highway primarily for through traffic usually on a continuous route.

A-WEIGHTED SOUND LEVEL (dBA). The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

1 BTU/HOUR. British thermal units per hour, also referred to as Btu. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate. A ton of refrigeration is 12,000 Btu, the amount of heat required to melt a ton (2,000 pounds) of ice at 32° Fahrenheit.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL). A metric similar to the day-night average sound level (Ldn), except that a 5 decibel adjustment is added to the equivalent continuous sound exposure level for evening hours (7pm to 10pm) in addition to the 10 dB nighttime adjustment used in the Ldn.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. "Composite wood products" does not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber, timber, prefabricated wood I–joists or finger–jointed lumber, all as specified in California Code of Regulations (CCR), Title 17, Section 93120.1(a).

Note: See CCR, Title 17, Section 93120.1.

DAY-NIGHT AVERAGE SOUND LEVEL (Ldn). The A-weighted equivalent continuous sound exposure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10p.m. to 7 a.m.).

DECIBEL (db). A measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the *California Electrical Code*, off-road, self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.

ELECTRIC VEHICLE CHARGING STATION(S) (EVCS)). One or more spaces intended for charging electric vehicles.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

ENERGY EQUIVALENT (NOISE) LEVEL (Leq). The level of a steady noise which would have the same energy as the fluctuating noise level integrated over the time of period of interest.

EXPRESSWAY. An arterial highway for through traffic which may have partial control of access, but which may or may not be divided or have grade separations at intersections.

FREEWAY. A divided arterial highway with full control of access and with grade separations at intersections.

GLOBAL WARMING POTENTIAL (GWP). The radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time. Carbon dioxide is the reference compound with a GWP of one.

GLOBAL WARMING POTENTIAL VALUE (GWP VALUE). A 100-year GWP value published by the Intergovernmental Panel on Climate Change (IPCC) in either its Second Assessment Report (SAR) (IPCC, 1995); or its Fourth Assessment A-3 Report (AR4) (IPCC, 2007). The SAR GWP values are found in column "SAR (100-yr)" of Table 2.14.; the AR4 GWP values are found in column "100 yr" of Table 2.14.

HIGH-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that is: (a) a chlorofluorocarbon, a hdrochlorofluorocarbon, a hydrofluorocarbon, a perfluorocarbon, or any compound or blend of compounds, with a GWP value equal to or greater than 150, or (B) any ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

LONG RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.5 times the pipe diameter.

LOW-GWP REFRIGERANT. A compound used as a heat transfer fluid or gas that: (A) has a GWP value less than 150, and (B) is not an ozone depleting substance as defined in Title 40 of the Code of Federal Regulations, Part 82, sec.82.3 (as amended March 10, 2009).

MERV. Filter minimum efficiency reporting value, based on ASHRAE 52.2–1999.

MAXIMUM INCREMENTAL REACTIVITY (MIR). The maximum change in weight of ozone formed by adding a compound to the "Base REactive Organic Gas (ROG) Mixture" per weight of compound added, expressed to hundredths of a gram (g O^3/g ROC).

PRODUCT-WEIGHTED MIR (PWMIR). The sum of all weighted-MIR for all ingredients in a product subject to this article. The PWMIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging).

PSIG. Pounds per square inch, guage.

REACTIVE ORGANIC COMPOUND (ROC). Any compound that has the potential, once emitted, to contribute to ozone formation in the troposphere.

SCHRADER ACCESS VALVES. Access fittings with a valve core installed.

SHORT RADIUS ELBOW. Pipe fitting installed between two lengths of pipe or tubing to allow a change of direction, with a radius 1.0 times the pipe diameter.

SUPERMARKET. For the purposes of Section 5.508.2, a supermarket is any retail food facility with 8,000 square feet or more conditioned area, and that utilizes either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units.

VOC. A volatile organic compound broadly defined as a chemical compound based on carbon chains or rings with vapor pressures greater than 0.1 millimeters of mercury at room temperature. These compounds typically contain hydrogen and may contain oxygen, nitrogen and other elements. See CCR Title 17, Section 94508(a)

Note: Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

SECTION 5.503 FIREPLACES

5.503.1 FIREPLACES. Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

5.503.1.1 Woodstoves. Woodstoves and pellet stoves shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent label indicating they are certified to meet the emission limits.

SECTION 5.504 POLLUTANT CONTROL

5.504.1 TEMPORARY VENTILATION. The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992 Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilation equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

DISCLAIMER:*THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CAL GREEN CHECKLIST

SHEET NO.:
G-032

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEW DATE NOVEMBER 30, 2027
STATE OF CALIFORNIA

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2022 CALIFORNIA GREEN BUILDING STANDARDS CODE
NONRESIDENTIAL MANDATORY MEASURES, SHEET 3 (January 2023)

Y = YES
N/A = NOT APPLICABLE
RESPON. PARTY = RESPONSIBLE PARTY (ie: ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY
☐	☐	
X		

5.504.4 FINISH MATERIAL POLLUTANT CONTROL. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

5.504.4.1 Adhesives, sealants and caulks. Adhesives, sealants, and caulks used on the project shall meet the requirements of the following standards:

1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1168 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.

2. Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT[1,2]

Less Water and Less Exempt Compounds in Grams per Liter

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT SPECIFICALLY LISTED	50
SPECIALTY APPLICATIONS	
PVC WELDING	510
CPVC WELDING	490
ABS WELDING	325
PLASTIC CEMENT WELDING	250
ADHESIVE PRIMER FOR PLASTIC	550
CONTACT ADHESIVE	80
SPECIAL PURPOSE CONTACT ADHESIVE	250
STRUCTURAL WOOD MEMBER ADHESIVE	140
TOP & TRIM ADHESIVE	250
SUBSTRATE SPECIFIC APPLICATIONS	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

1. IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.

2. FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF

TABLE 5.504.4.2 - SEALANT VOC LIMIT

Less Water and Less Exempt Compounds in Grams per Liter

SEALANTS	CURRENT VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
SEALANT PRIMERS	
ARCHITECTURAL	
NONPOROUS	250
POROUS	775
MODIFIED BITUMINOUS	500
MARINE DECK	760
OTHER	750

NOTE: FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THESE TABLES, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168.

5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with VOC limits in Table 1 of the ARB Architectural Coatings Suggested Control Measure, as shown in Table 5.504.4.3, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table 5.504.4.3 shall be determined by classifying the coating as a Flat, Nonflat or Nonflat-High Gloss coating, based on its gloss, as defined in Subsections 4.21, 4.36 and 4.37 of the 2007 California Air Resources Board Suggested Control Measure, and the corresponding Flat, Nonflat or Nonflat-High Gloss VOC limit in Table 5.504.4.3 shall apply.

5.504.4.3.1 Aerosol Paints and coatings. Aerosol paints and coatings shall meet the PWMIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

Y	N/A	RESPON. PARTY

TABLE 5.504.4.3 - CONT.

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS

COATING CATEGORY	CURRENT VOC LIMIT
SPECIALTY COATINGS	
ALUMINUM ROOF COATINGS	400
BASEMENT SPECIALTY COATINGS	400
BITUMINOUS ROOF COATINGS	50
BITUMINOUS ROOF PRIMERS	350
BOND BREAKERS	350
CONCRETE CURING COMPOUNDS	350
CONCRETE/MASONRY SEALERS	100
DRIVEWAY SEALERS	50
DRY FOG COATINGS	150
FAUX FINISHING COATINGS	350
FIRE RESISTIVE COATINGS	350
FLOOR COATINGS	100
FORM-RELEASE COMPOUNDS	250
GRAPHIC ARTS COATINGS (SIGN PAINTS)	500
HIGH-TEMPERATURE COATINGS	420
INDUSTRIAL MAINTENANCE COATINGS	250
LOW SOLIDS COATINGS[1]	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS:	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & TILE REFINISH COATINGS	420
WATERPROOFING MEMBRANES	250
WOOD COATINGS	275
WOOD PRESERVATIVES	350
ZINC-RICH PRIMERS	340

1. GRAMS OF VOC PER LITER OF COATING, INCLUDING WATER & EXEMPT COMPOUNDS

2. THE SPECIFIED LIMITS REMAIN IN EFFECT UNLESS REVISED LIMITS ARE LISTED IN SUBSEQUENT COLUMNS IN THE TABLE.

3. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency. Documentation may include, but is not limited to, the following:

1. Manufacturer's product specification
2. Field verification of on-site product containers

5.504.4.4 Carpet Systems.
All carpet installed in the building interior shall meet the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Version 1.2, January 2017 (Emission testing method for California Specifications 01350).

See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the California Department of Public Health,"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,"Version 1.2, January 2017 (Emission testing method for California Specifications 01350).

See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1.

5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure (ATCM) for Composite Wood (17 CCR 93120 et seq.). Those materials not exempted under the ATCM must meet the specified emission limits, as shown in Table 5.504.4.5.

5.504.4.5.3 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:

1. Product certifications and specifications.
2. Chain of custody certifications.
3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards.
5. Other methods acceptable to the enforcing agency.

TABLE 5.504.4.5 - FORMALDEHYDE LIMITS[1]

MAXIMUM FORMALDEHYDE EMISSIONS IN PARTS PER MILLION

PRODUCT	CURRENT LIMIT
HARDWOOD PLYWOOD VENEER CORE	0.05
HARDWOOD PLYWOOD COMPOSITE CORE	0.05
PARTICLE BOARD	0.09
MEDIUM DENSITY FIBERBOARD	0.11
THIN MEDIUM DENSITY FIBERBOARD[2]	0.13

1. VALUES IN THIS TABLE ARE DERIVED FROM THOSE SPECIFIED BY THE CALIFORNIA AIR RESOURCES BOARD, AIR TOXICS CONTROL MEASURE FOR COMPOSITE WOOD AS TESTED IN ACCORDANCE WITH ASTM E 1333. FOR ADDITIONAL INFORMATION, SEE CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 93120 THROUGH 93120.12.

2. THIN MEDIUM DENSITY FIBERBOARD HAS A MAXIMUM THICKNESS OF 5/16 INCHES (8 MM).

Y	N/A	RESPON. PARTY
☐	☐	
X		
☐	☐	
X		
☐	☐	
X		
☐	☐	
X		
☐	☐	
X		
☐	☐	

5.504.4.6 Resilient flooring systems. Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall meet the requirements of the California Department of Public Health,"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2, January 2017 (Emission testing method for California Specifications 01350)

See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.6.1 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

5.504.4.7 Thermal insulation
Comply with the requirements of the California Department of Public Health, "Standard Method of the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, "Version 1.2, January 1.2, January 2017 (Emission testing method for California Specification 01350).
See California Department of Public Health's website for certification programs and testing labs.
https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx#material

5.504.4.7.1 Verification of compliance.
Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.

5.504.4.8 Acoustical ceiling and wall panels.
Comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, " Version 1.2, January 2017 (Emission testing method for California Specification 01350).
See California Department of Public Health's website for certification programs and testing labs.

5.504.4.8.1 Verification of compliance. Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.

5.504.5.3 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

Exceptions: Existing mechanical equipment.

5.504.5.3.1 Labeling. Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.

5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL. Where outdoor areas are provided for smoking, prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University, or campus of the University of California, whichever are more stringent. When ordinances, regulations or policies are not in place, post signage to inform building occupants of the prohibitions.

SECTION 5.505 INDOOR MOISTURE CONTROL

5.505.1 INDOOR MOISTURE CONTROL. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2 of this code.

SECTION 5.506 INDOOR AIR QUALITY

5.506.1 OUTSIDE AIR DELIVERY. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the *California Energy Code*, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

5.506.2 CARBON DIOXIDE (CO_2) MONITORING. For buildings or additions equipped with demand control ventilation, CO_2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120(c)(4).

5.506.3 Carbon dioxide (CO2) monitoring in classrooms.
(DSA-SS) Each public K-12 school classroom, as listed in Table 120.1-A of the *California Energy Code*, shall be equipped with a carbon dioxide monitor or sensor that meets the following requirements:

1. The monitor or sensor shall be permanently affixed in a tamper-proof manner in each classroom between 3 and 6 feet (914 mm and 1829 mm) above the floor and at least 5 feet (1524 mm) away from door and operable windows.
2. When the monitor or sensor is not integral to an Energy Management Control System (EMCS), the monitor or sensor shall display the carbon dioxide readings on the device. When the sensor is integral to an EMCS, the carbon dioxide readings shall be available to and regularly monitored by facility personnel.
3. A monitor shall provide notification though a visual indicator on the monitor when the carbon dioxide levels in the classroom have exceeded 1,100ppm. A sensor integral to an EMCS shall provide notification to facility personnel through a visual and/or audible indicator when the carbon dioxide levels in the classroom have exceeded 1,100ppm.
4. The monitor or sensor shall measure carbon dioxide levels at minimum 15- minute intervals and shall maintain a record of previous carbon dioxide measurements of not less than 30 days duration.
5. The monitor or sensor used to measure carbon dioxide levels shall have the capacity to measure carbon dioxide levels with a range of 400ppm to 2000ppm or greater.
6. The monitor or sensor shall be certified by the manufacturer to be accurate within 75ppm at 1,000ppm carbon dioxide concentration and shall be certified by the manufacturer to require calibration no more frequently than once every 5 years.

SECTION 5.507 ENVIRONMENTAL COMFORT

5.507.4 ACOUSTICAL CONTROL. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413, or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

Exception: Buildings with few or no occupants or where occupants are not likely to be affected by exterior noise, as determined by the enforcement authority, such as factories, stadiums, storage, enclosed parking structures and utility buildings.

Exception: [DSA-SS] For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

   Exceptions:

   1. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
   2. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1. Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{eq} - 1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance Method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation.

5.507.4.2.1 Site Features. Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.

5.507.4.2.2 Documentation of Compliance. An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

Note: Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: www.toolbase.org/PDF/CaseStudies/stc_icc_ratings.pdf.

SECTION 5.508 OUTDOOR AIR QUALITY

5.508.1 Ozone depletion and greenhouse gas reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 Chlorofluorocarbons (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 Halons. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

Y	N/A	RESPON. PARTY
☐	☐	
X		

5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities.

Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.

5.508.2.1 Refrigerant piping. Piping compliant with the California Mechanical Code shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

5.508.2.1.1 Threaded pipe. Threaded connections are permitted at the compressor rack.

5.508.2.1.2 Copper pipe. Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.

5.508.2.1.2.1 Anchorage. One-fouth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.

5.508.2.1.3 Flared tubing connections. Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.

Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial sealant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

5.508.2.1.4 Elbows. Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.

5.508.2.2 Valves. Valves Valves and fittings shall comply with the *California Mechanical Code* and as follows.

5.508.2.2.1 Pressure relief valves. For vessels containing high-GWP refrigerant, a rupture disc shall be installed between the outlet of the vessel and the inlet of the pressure relief valve.

5.508.2.2.1.1 Pressure detection. A pressure gauge, pressure transducer or other device shall be installed in the space between the rupture disc and the relief valve inlet to indicate a disc rupture or discharge of the relief valve.

5.508.2.2.2 Access valves. Only Schrader access valves with a brass or steel body are permitted for use.

5.508.2.2.2.1 Valve caps. For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.

5.508.2.2.2.2 Seal caps. If designed for it, the cap shall have a neoprene O-ring in place.

5.508.2.2.2.2.1 Chain tethers. Chain tethers to fit ov the stem are required for valves designed to have seal caps.

Exception: Valves with seal caps that are not removed from the valve during stem operation.

5.508.2.3 Refrigerated service cases. Refrigerated service cases holding food products containing vinegar and salt shall have evaporator coils of corrosion-resistant material, such as stainless steel; or be coated to prevent corrosion from these substances.

5.508.2.3.1 Coil coating. Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.

5.508.2.4 Refrigerant receivers. Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device tha indicates the level of refrigerant in the receiver.

5.508.2.5 Pressure testing. The system shall be pressure tested during installation prior to evacuation and charging.

5.508.2.5.1 Minimum pressure. The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.

5.508.2.5.2 Leaks. Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.

5.508.2.5.3 Allowable pressure change. The system shall stand, unaltered, for 24 hours with no more than a +/- one pound pressure change from 300 psig, measured with the same gauge.

5.508.2.6 Evacuation. The system shall be evacuated after pressure testing and prior to charging.

5.508.2.6.1 First vacuum. Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.

5.508.2.6.2 Second vacuum. Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.

5.508.2.6.3 Third vacuum. Pull a third vacuum down to a minimum of 300 microns, and hold for 24 hours with a maximum drift of 100 microns over a 24-hour period.

CHAPTER 7
INSTALLER & SPECIAL INSPECTOR QUALIFICATIONS

702 QUALIFICATIONS

702.1 INSTALLER TRAINING. HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:

1. State certified apprenticeship programs.
2. Public utility training programs.
3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.
4. Programs sponsored by manufacturing organizations.
5. Other programs acceptable to the enforcing agency.

702.2 SPECIAL INSPECTION [HCD]. When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:

1. Certification by a national or regional green building program or standard publisher.
2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.
3. Successful completion of a third party apprentice training program in the appropriate trade.
4. Other programs acceptable to the enforcing agency.

Notes:

1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.
2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).

[BSC-CG] When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.

Note: Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.

703 VERIFICATIONS

703.1 DOCUMENTATION. Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.

DISCLAIMER: *THIS DOCUMENT IS PROVIDED AND INTENDED TO BE USED AS A MEANS TO INDICATE AREAS OF COMPLIANCE WITH THE CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE. DUE TO THE VARIABLES BETWEEN BUILDING DEPARTMENT JURISDICTIONS, THIS CHECKLIST IS TO BE USED ON AN INDIVIDUAL PROJECT BASIS AND MAY BE MODIFIED BY THE END USER TO MEET THOSE INDIVIDUAL NEEDS. THE END USER ASSUMES ALL RESPONSIBILITY ASSOCIATED WITH THE USE OF THIS DOCUMENT, INCLUDING VERIFICATION WITH THE FULL CODE.*

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
EXPIRATION DATE
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

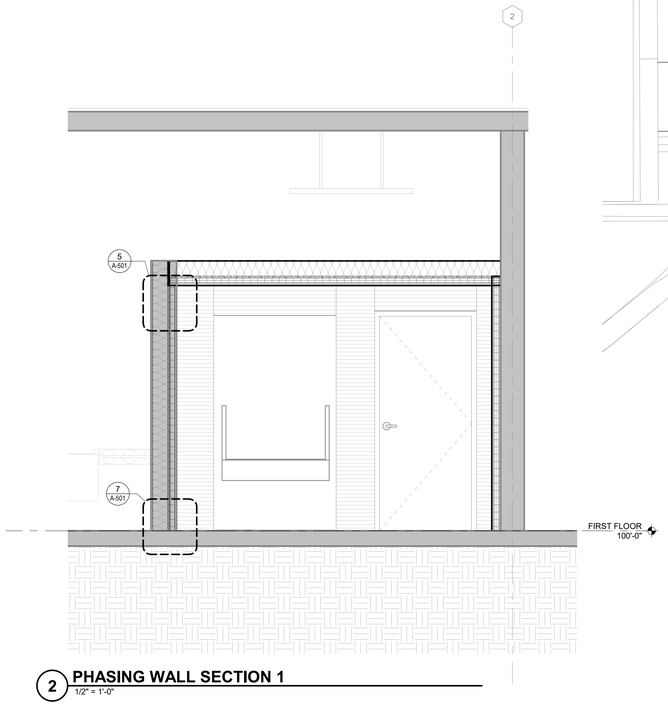
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1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

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DATE: January 28, 2026
DESIGNED BY: DA
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CHECKED BY: JC
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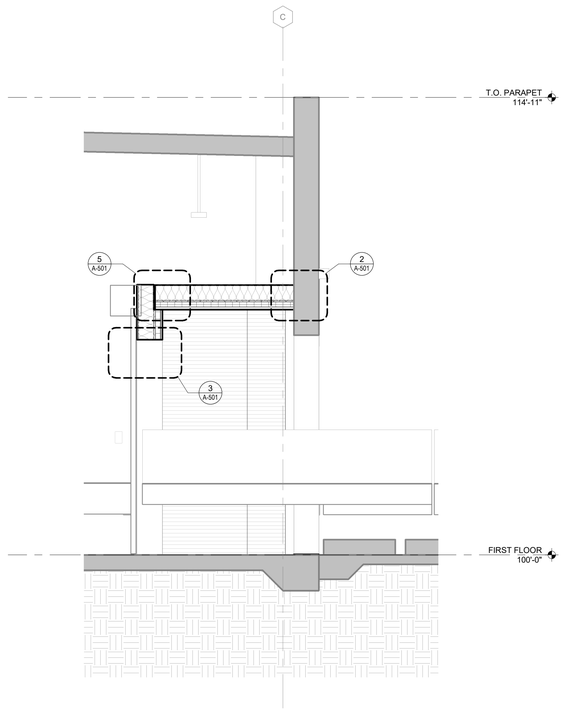
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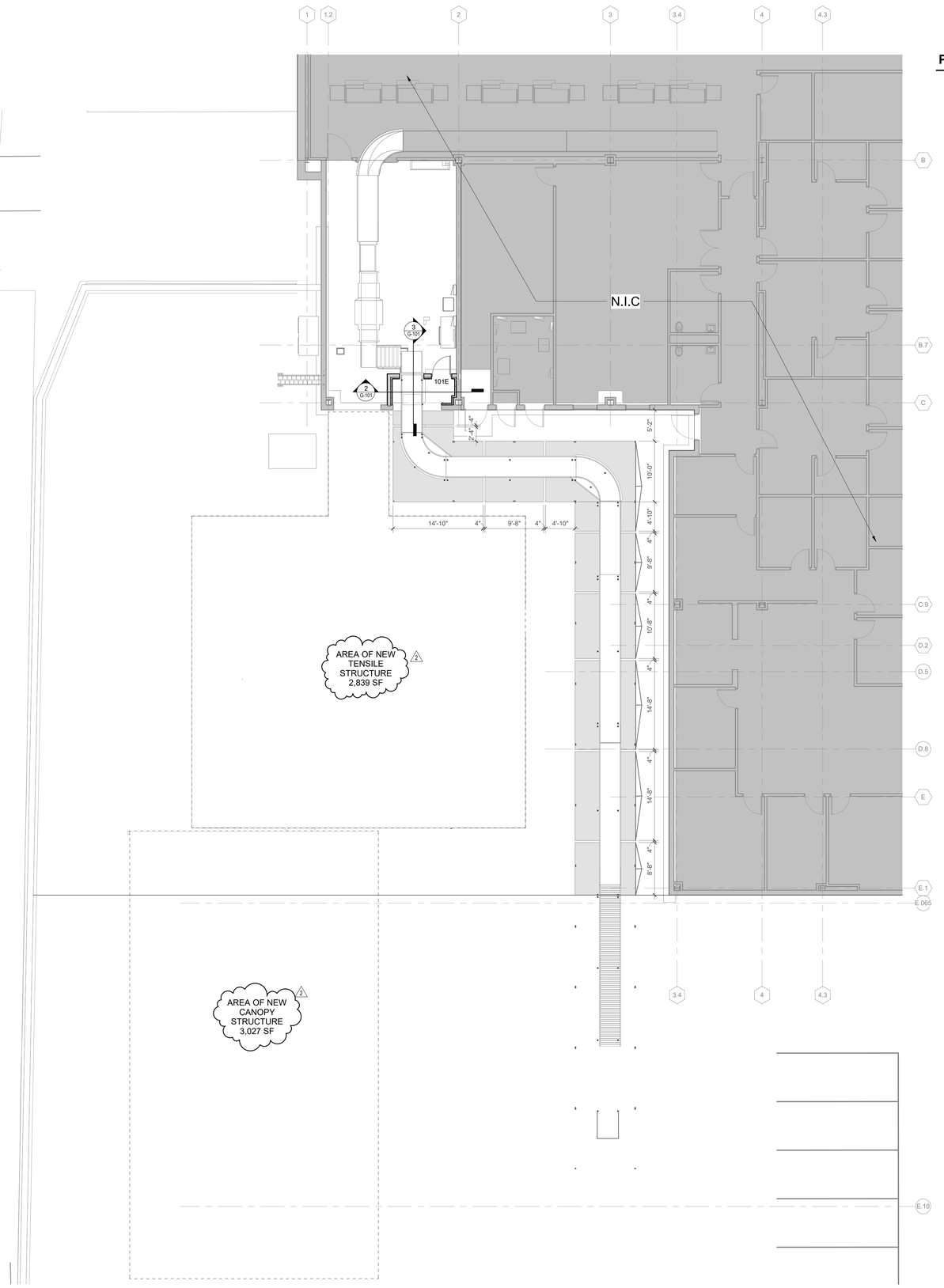
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2 PHASING WALL SECTION 1
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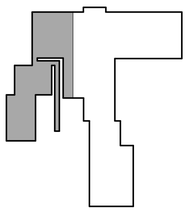
3 PHASING WALL SECTION 2
1/2" = 1'-0"



N 1 FIRST FLOOR PHASING PLAN
1/8" = 1'-0"

PHASING PLAN GENERAL NOTES:

1. TEMPORARY WALL LOCATIONS ARE APPROXIMATE. CONTRACTOR TO PROVIDE COMPLETE LAYOUT OF TEMPORARY WALLS, PASSENGER SEATING AND GATE CONFIGURATION TO ACCOMMODATE PHASING AS REQUIRED. TEMPORARY WALL LOCATIONS AND PENETRATIONS MUST BE COORDINATED WITH THE AIRPORT AT LEAST 30 DAYS IN ADVANCE TO ALLOW TIME FOR TSA APPROVAL.
2. PHASING PLANS AND NOTES ARE INTENDED FOR PHASING PURPOSES ONLY. REFER TO DISCIPLINE SHEETS FOR DEMOLITION AND NEW CONSTRUCTION INFORMATION.
3. CONSTRUCTION SCHEDULE BY CONTRACTOR SHALL BE IN ACCORDANCE WITH PHASING PLANS.THE AIRPORT SHALL REMAIN IN FULL OPERATION WITH A MINIMUM OF THREE GATES OPERATIONAL THROUGHOUT CONSTRUCTION.
4. THE CONTRACTOR WILL COORDINATE CONSTRUCTION ACTIVITIES WITH AIRPORT SECURITY AND OPERATIONS 30 DAYS PRIOR TO STARTING WORK. CONTRACTOR SHALL SCHEDULE AND COORDINATE ALL TEMPORARY WALKWAY / ACCESS BY PUBLIC AND EMPLOYEES BASED ON PHASING ACTIVITIES.
5. ALL SERVICES TO BE MAINTAINED TO ALL OCCUPIED AREAS. COORDINATE ANY DISRUPTIONS OF ANY SERVICE WITH THE AIRPORT FOR TIMES WHEN THE TERMINAL BUILDING IS NOT IN USE.
6. COORDINATE AND REVIEW EACH PHASE WITH AIRPORT AT LEAST 30 DAYS PRIOR TO DEMOLITION / CONSTRUCTION.
7. SUB-PHASING BETWEEN AREAS AND WITHIN PHASES MAY BE REQUIRED TO COMPLETE CONSTRUCTION AND MAINTAIN OPERATIONS. WORK OUTSIDE OF PHASING AREAS MAY BE REQUIRED TO MAINTAIN OPERATIONS AND SCHEDULE.
8. PROVIDE TEMPORARY CONSTRUCTION INFORMATION, DIRECTIONAL AND SAFETY (OSHA) SIGNAGE DURING CONSTRUCTION PHASES TO ASSIST WITH PASSENGER AND EMPLOYEE MOVEMENT AND SAFETY. CONTRACTOR TO SUBMIT TEMPORARY SIGN PLAN AT LEAST 30 DAYS PRIOR TO STARTING EACH PHASE OF WORK.
9. PROTECT ALL OPERATIONAL EQUIPMENT FROM DAMAGE DURING CONSTRUCTION INCLUDING POWER CORDS.
10. NO CONTRACTOR TOOLS, EQUIPMENT, OR MATERIALS MAY BE LEFT UNATTENDED AT ANY TIME IN THE STERILE AREA OR SECURITY IDENTIFICATION DISPLAY AREA (SIDA) AND ARE REQUIRED TO REMAIN WITHIN SIGHT AND ARM'S LENGTH OF CONTRACTOR EMPLOYEE(S) AUTHORIZED TO BE WITHIN THE STERILE AREA OR SIDA. COMPANIES AND/OR INDIVIDUALS FOUND TO BE IN NON-COMPLIANCE WILL FACE REVOCATION OF ACCESS PRIVILEGES AND/OR MONETARY FINES AND/OR PROSECUTION AND/OR THE PROJECT MAY BE SHUT DOWN AT THE DISCRETION OF THE AIRPORT COMMISSION. SEE SPECIFICATION SECTION 013051З – CONSTRUCTION SAFETY PHASING PLAN FOR MORE INFORMATION.
11. ALL WELDING IS TO BE COMPLETED AT TIMES WHEN THE TERMINAL BUILDING IS NOT IN USE.
12. ALL WORK TO COMPLY WITH ALL OSHA REGULATIONS.



KEY PLAN

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

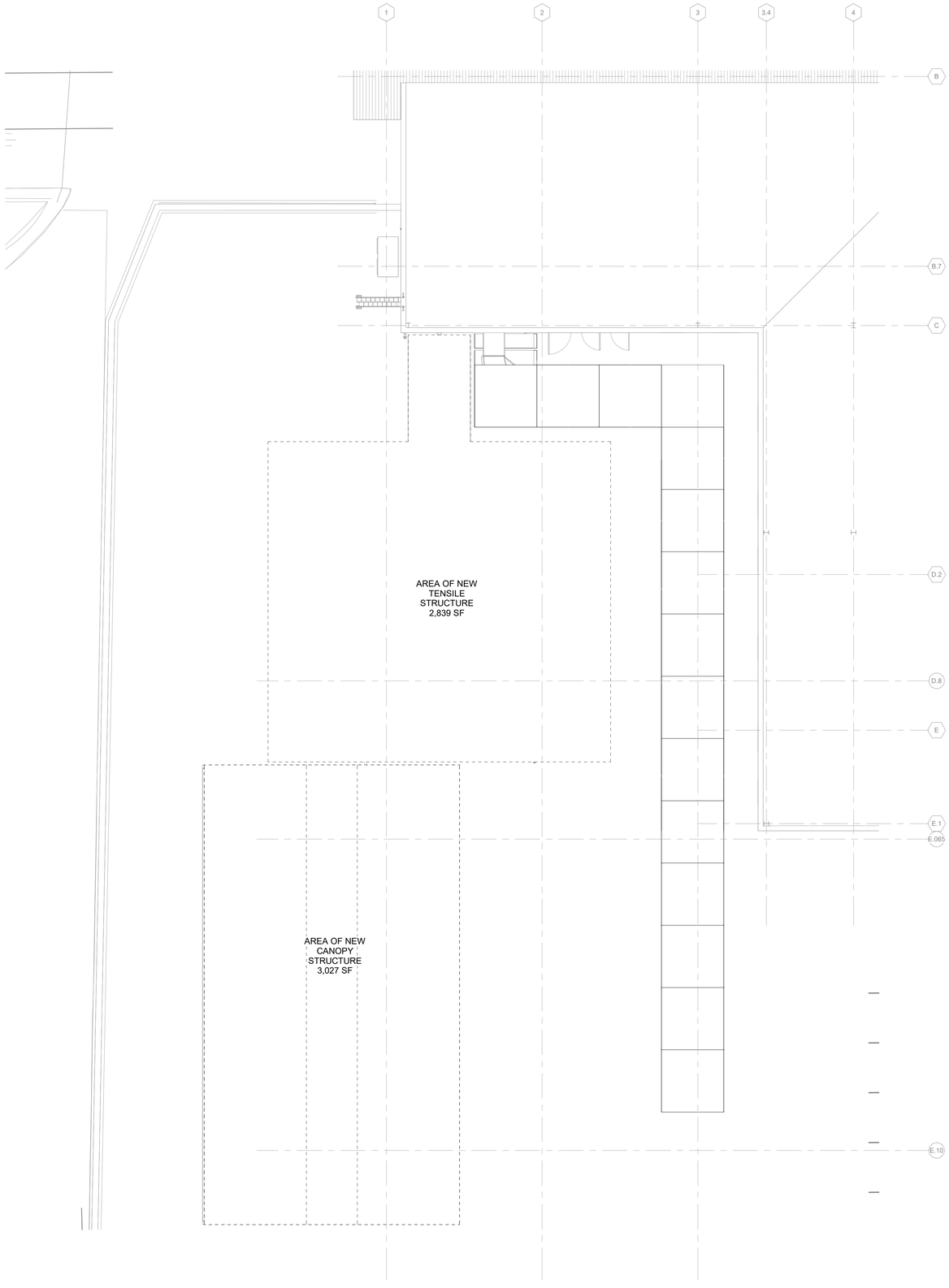
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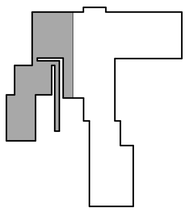
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N 1 **ROOF PLAN - AREA A**
1/8" = 1'-0"



KEY PLAN

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BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

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PHASING ROOF PLAN

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AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ALT	ALTERNATE
APCH	APPROACH
APPROX	APPROXIMATE
ARFF	AIR RESCUE AND FIRE FIGHTING
ATCT	AIR TRAFFIC CONTROL TOWER
ATO	AIR TRAFFIC ORGANIZATION
AWG	AMERICAN WIRE GAUGE
BC	BEGINNING OF CURVE
BLDG	BUILDING
BM	BENCHMARK
BMP	BEST MANAGEMENT PRACTICE
BOT	BOTTOM
BVC	BEGINNING OF VERTICAL CURVE
C-C	CENTER TO CENTER
C	CURVE
CALTRANS	CALIFORNIA DEPARTMENT OF TRANSPORTATION
CASQA	CALIFORNIA STORMWATER QUALITY ASSOCIATION
CB	CATCH BASIN
CIPCP	CAST-IN-PLACE CONCRETE PIPE
CJ	CONSTRUCTION JOINT
CFS	CUBIC FEET PER SECOND
CL, C/L	CENTERLINE
CLF	CHAIN-LINK FENCE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CONT	CONTINUOUS
CRGO	CARGO
CP	CONTROL POINT
CU	COPPER
DB	DIRECT BURIAL
DEG	DEGREE
DI	DROP INLET
DIA	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DP	DEPTH
(E), EX	EXISTING
E	ELECTRICAL LINE, EASTING
EC	END OF CURVE
EG	EXISTING GRADE
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
ESA	ENVIRONMENTAL SENSITIVE AREA
EV	ELECTRIC VEHICLE
EVC	END OF VERTICAL CURVE
FES	FLARED END SECTION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FNC	FENCE
FPS	FEET PER SECOND
FT	FEET
G	NATURAL GAS LINE
GAL	GALLON
GALV	GALVANIZED
GB	GRADE BREAK
GND	GROUND
GPM	GALLONS PER MINUTE
GS	GROUND SHOT
H	HEIGHT
HDPE	HIGH DENSITY POLYETHYLENE
HIRL	HIGH INTENSITY RUNWAY LIGHT
HITHL	HIGH INTENSITY THRESHOLD LIGHT
HORIZ	HORIZONTAL
HMA	HOT MIX ASPHALT
HWY	HIGHWAY
IE	INVERT ELEVATION
IN	INCHES
IP	IN-PAVEMENT
K	RATE OF CHANGE OF VERTICAL CURVE
L	LENGTH, LEFT, LINE, LIGHT
LAT	LATITUDE
LBS	POUNDS
LED, (L)	LIGHT EMITTING DIODE
LF	LINEAL FEET
LOC	LOCALIZER
LONG	LONGITUDE
LWL	LOW WATER LEVEL
LT	LIGHT
MH	MANHOLE
MAX	MAXIMUM
MG	MILLED GRADE
MID	MIDPOINT
MIN	MINIMUM
MAG	MAGNETIC
MPH	MILES PER HOUR
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
(N)	NEW
N	NORTHING
NIC	NOT IN CONTRACT
NO. OR #	NUMBER
NOTAM	NOTICE TO AIRMEN
NTS	NOT TO SCALE
OFF, O/S	OFFSET
OC	ON CENTER
OH	OVERHEAD
PAPI	PRECISION APPROACH PATH INDICATOR
PB	PULL BOX
P&P	PLAN AND PROFILE
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE
PCF	POUNDS PER CUBIC FOOT
PED	PEDESTAL
PERF	PERFORATED
PFC	POROUS FRICTION COURSE
PI	POINT OF INTERSECTION
POB	POINT OF BEGINNING
POC	POINT OF CURVE
POE	POINT OF ENDING
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
PT	POINT, POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVE
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
QTY	QUANTITY
R	RIGHT, RADIUS
R&R	REMOVE AND REPLACE
RAC	RENT-A-CAR
RC	RELATIVE COMPACTION
REL	RELOCATE EXISTING
RCP	REINFORCED CONCRETE PIPE
REQ	REQUIRED
RPR	RESIDENT PROJECT REPRESENTATIVE
ROS	RECORD OF SURVEY
R/W	RIGHT OF WAY
RTR	REMOTE TRANSMITTER/RECEIVER
RWA	RESTRICTED WORK AREA
S	SANITARY LINE, SALVAGED
SCHD	SCHEDULE
SF	SQUARE FOOT
SG	STRAIGHT GRADE
SH	SHOULDER
SIDA	SECURE IDENTIFICATION DISPLAY AREA
SPCD	SAFETY PLAN COMPLIANCE DOCUMENT
SS	STAINLESS STEEL
SD	STORM DRAIN
STA	STATION
STD	STANDARD
STL	STEEL
SY	SQUARE YARDS
T	TELEPHONE LINE
TC	TOP OF CURB
TG	TOP OF GRATE
T/L	TAXILANE
TOE	TOE OF BANK
TOP	TOP OF BANK
TOW	TOP OF WALL
TDZ	TOUCHDOWN ZONE
TW/TWY	TAXIWAY
TYP	TYPICAL
UD	UNDERDRAIN
OFA	OBJECT FREE AREA
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
USA	UNDERGROUND SERVICE ALERT
V	VELOCITY
V	VOLT
VC	VERTICAL CURVE
VDROP	VOLTAGE DROP
VERT	VERTICAL
VG	VALLEY GUTTER
VIF	VERIFY IN FIELD
W	WIDTH, WEST, WATER LINE
W/	WITH
W/O	WITHOUT
WDID	STORMWATER WASTE DISCHARGE IDENTIFICATION
WSE	WATER SURFACE ELEVATION
WSP	WELDED STEEL PIPE
WV	WATER VALVE
WWM	WELDED WIRE MESH

GENERAL CIVIL NOTES:

1. ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION COVERED BY THIS PLAN SHALL BE IN ACCORDANCE WITH COUNTY, CITY, AND CALTRANS SPECIFICATIONS FOR CONSTRUCTION UNLESS SPECIFIED OTHERWISE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS, METHODS, SEQUENCING AND SAFETY PROCEDURES, EQUIPMENT, AND DEVICES USED DURING CONSTRUCTION UNLESS SPECIFICALLY ADDRESSED OTHERWISE.
3. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION COVERED BY THIS PLAN.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE THE WORK COVERED BY THIS PLAN.
5. A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATION OF EXISTING UNDERGROUND FACILITIES IN THE CONSTRUCTION AREA. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO THE EXISTING FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS. CONTRACTOR SHALL CONTACT USA NORTH 811 PRIOR TO ANY EXCAVATION.
6. DISPOSAL OF WASTE MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL ASSUME ALL WASTE MATERIAL WILL BE REQUIRED TO BE HAULED AND DISPOSED OFF AIRPORT PROPERTY. ALL COSTS ASSOCIATED WITH OFF HAUL (INCLUDING ANY ENVIRONMENTAL TESTING) SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BARRICADING AND TRAFFIC CONTROL REQUIRED TO MAINTAIN SAFE AND SECURE ACCESS AT THE PROJECT SITE. CONTRACTOR'S ACCESS AND TRAFFIC CONTROL PLAN WILL BE IN ACCORDANCE WITH THE CONSTRUCTION SAFETY AND PHASING PLAN.
8. THE CONTRACTOR SHALL PROTECT ALL UTILITIES WITHIN THE PROJECT LIMITS AS SHOWN IN THE PLANS. THE CONTRACTOR SHALL NOTIFY THE AIRPORT AND UTILITY OWNER OF DAMAGE TO ANY UTILITY. DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
9. EMERGENCY ACCESS TO ALL FIRE HYDRANTS AND PIPE STANDS SHALL BE MAINTAINED AT ALL TIMES.
10. THE CONTRACTOR SHALL MAKE REQUESTS FOR FACILITY CLOSURES A MINIMUM OF 48 HOURS IN ADVANCE OF SUCH CLOSURES. THE AIRPORT WILL HAVE THE FINAL APPROVAL AUTHORITY OF SUCH CLOSURES. THE AIRPORT RETAINS THE RIGHT TO CANCEL ANY SUCH CLOSURES IN THE INTEREST OF AIRPORT SAFETY AND/OR CRITICAL OPERATIONS.
11. THE LOCATION OF HAUL ROUTES ON THE AIRPORT SHALL BE AS SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES WITH THE PARTY HAVING JURISDICTION OVER THE AFFECTED ROUTE. ON-SITE HAUL ROUTES WILL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF WORK, OR AS DEEMED NECESSARY BY THE AIRPORT OR ENGINEER. FENCING, DRAINAGE, GRADING, OR OTHER WORK NECESSARY TO CONSTRUCT HAUL ROUTES ON THE AIRPORT IS THE CONTRACTOR'S RESPONSIBILITY AND MUST BE APPROVED BY THE ENGINEER PRIOR TO THE WORK.
12. THE CONTRACTOR SHALL NOT ENTER ONTO ANY AREA OUTSIDE OF THE CONSTRUCTION PHASING LIMITS, STAGING AREA, OR DESIGNATED HAUL ROUTES WITHOUT THE WRITTEN APPROVAL OF THE AIRPORT.
13. THE CONTRACTOR SHALL DESIGNATE A PERSON AND TWO BACKUP PEOPLE WHO CAN BE CONTACTED 24 HOURS A DAY IN THE EVENT OF AN EMERGENCY. THESE PEOPLE SHALL BE AUTHORIZED TO MAKE FIELD DECISIONS ON THE COMPANY'S BEHALF AND BE ABLE TO RESPOND WITHIN TWO HOURS OF INITIAL CONTACT.
14. ACCESS FOR AIRPORT RESCUE AND FIRE FIGHTING (ARFF) OR LOCAL RESCUE AND FIRE FIGHTING EQUIPMENT AND PERSONNEL SHALL BE MAINTAINED AT ALL TIMES. THE ARFF OR LOCAL OPERATIONS SHALL HAVE RIGHT-OF-WAY OVER ALL CONTRACTOR'S OPERATIONS AT ALL TIMES.
15. THE CONTRACTOR IS REQUIRED TO PROVIDE LIGHTING FOR CONSTRUCTION THAT OCCURS DURING HOURS OF DARKNESS. THE COST OF THE LIGHTING DURING SAID HOURS SHALL BE INCIDENTAL TO THE PROJECT.
16. A SOIL OR CIVIL ENGINEER TO DETERMINE GRADING PERFORMED IS IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED PLANS AND IS SUITABLE TO SUPPORT THE INTENDED STRUCTURE(S).
17. ALL REQUIRED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED, INSTALLED, AND MAINTAINED AS SHOWN ON THE APPLICABLE EROSION AND SEDIMENT CONTROL PLANS AND SHALL COMPLY WITH THE CALIFORNIA STATE WATER RESOURCES CONTROL BOARD REQUIREMENTS.
18. ALL NEW PAVEMENT AND SIDEWALKS SHALL BE CONSTRUCTED FLUSH WITH EXISTING PAVEMENT, WITH NO PONDING OF STORMWATER, UNLESS NOTED OTHERWISE.
19. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, COORDINATES, AND DIMENSIONAL INFORMATION PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BRING ALL DISCREPANCIES TO THE ATTENTION OF THE ENGINEER PRIOR TO STARTING CONSTRUCTION.
20. ALL TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) AND "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), LATEST EDITION.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING INSTALLATION OF ALL NEW UTILITIES WITH THOSE THAT ARE EXISTING. IF EXISTING UTILITIES ARE IN CONFLICT WITH NEW UTILITIES, THE SITE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
22. THE LOCATION OF ALL EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION OF THESE UTILITIES. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLAN OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE BY THE CONTRACTOR IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL COORDINATE DISCONNECTION OF EXISTING UTILITIES WITH THE APPROPRIATE UTILITY PROVIDER.
23. UTILITIES INDICATED SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE SPECIFICATIONS. GRADING SHALL BE AS INDICATED, AND SHALL PRODUCE A FINISHED SURFACE WITH NO PONDING OF WATER.
24. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND IN HAND BEFORE BEGINNING ANY CONSTRUCTION. NO CONSTRUCTION OR FABRICATION OF ANY ITEM SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED ALL PLANS AND ANY OTHER DOCUMENTATION FROM ALL OF THE PERMITTING AND ANY OTHER REGULATORY AUTHORITIES. ANY PENALTIES, STOP WORK ORDERS OR ADDITIONAL WORK RESULTING FROM THE CONTRACTOR BEING IN VIOLATION OF THE ABOVE REQUIREMENTS, SHALL BE FULLY BORNE BY THE CONTRACTOR.
25. ALL CONTRACTORS/SUBCONTRACTORS THAT WILL BE ENGAGED IN LAND DISTURBING ACTIVITIES SHALL COMPLY WITH ALL EROSION, SEDIMENTATION AND POLLUTION CONTROL AND STORMWATER POLLUTION PREVENTION REQUIREMENTS CONTAINED THROUGHOUT THE DRAWINGS, SPECIFICATIONS, AND PERMITS.
26. AREAS DISTURBED BY THE CONTRACTOR, WHICH ARE NOT PART OF THIS PROJECT, SHALL BE RETURNED TO ORIGINAL OR BETTER CONDITION PRIOR TO THE COMPLETION OF THE PROJECT AS DETERMINED BY THE AIRPORT.
27. THE CONTRACTOR'S MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES IN PERFORMING THE WORK IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR, WHO IS ALSO RESPONSIBLE FOR COMPLYING WITH ALL HEALTH AND SAFETY PRECAUTIONS AS REQUIRED BY THE APPLICABLE REGULATORY AGENCY.
28. THE DESIGN ADEQUACY AND SAFETY OF ALL BRACING, SHORING AND TEMPORARY SUPPORTS, ETC. ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
29. PROTECT ALL EXISTING FEATURES AND EXISTING LANDSCAPING THAT WILL REMAIN. ANY ITEM DAMAGED DURING THE PERFORMANCE OF THE WORK WILL BE RESTORED TO ORIGINAL CONDITION, OR REPLACED WITH NEW AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL TAKE PRECAUTIONS TO AVOID OVERLOADING PAVEMENTS WHICH WILL REMAIN.
30. EACH SHEET IS PART OF A MULTI-SHEET SET OF CONSTRUCTION PLANS AND SHALL BE READ WITH THE FULL SET TO BEST ENSURE PROPER INTERPRETATION.
31. SHEET KEYNOTES ON THE PLANS ARE SPECIFIC TO THAT SHEET ONLY. MISSING SEQUENTIAL NUMBERS DO NOT APPLY TO THAT SHEET.

2

TOTAL PROJECT EARTHWORK		
CUT VOLUME (CY)	FILL VOLUME (CY)	NET VOLUME (CY)
274.94	7.78	-267.16

EARTHWORK NOTES:

1. EARTHWORK VOLUMES ARE UNADJUSTED AND CALCULATED BY COMPARING EXISTING GROUND SURFACE AND PROPOSED GROUND SURFACE DTM. VOLUMES ALSO INCLUDE FOR PAVEMENT THICKNESS AND FOUNDATION FOR CUT VOLUMES.

LEGEND - SYMBOL

- CONTROL POINT
- BOLLARD
- CLEANOUT, SANITORY OR STORM
- ELECTRIC METER
- ELECTRIC HANDHOLE (PULLBOX)
- ELECTRICAL TRANSFORMER
- FIRE HYDRANT
- LIGHT/BEACON
- SINGLE LIGHT, LIGHT POLE
- DOUBLE LIGHT, LIGHT POLE
- POWER POLE
- SANITARY SEWER MANHOLE
- SIGN (SINGLE POST)
- STORM INLET, ROUND
- STORM INLET, SQUARE
- STORM FLARED END SECTION
- STORM SEWER MANHOLE
- TELECOMMUNICATIONS MANHOLE
- TELECOMMUNICATIONS PEDESTAL BOX
- WATER VALVE
- SEE X-XXX — SHEET REFERENCE
- SEE X/X-XXX — DETAIL REFERENCE
- INLET PROTECTION
- INLET PROTECTION

LEGEND - HATCH

- PROJECT AREA
- CRANE STAGING AREA
- DEMOLISH (E) CONCRETE PAVEMENT
- DEMOLISH (E) ASPHALT PAVEMENT
- DEMOLISH (E) SIDEWALK
- EXISTING CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE

LEGEND - LINETYPE

- EXISTING CONTOUR LINES
- PROPOSED CONTOUR LINES
- GRADE BREAK
- DISTURBANCE LIMITS
- PAVEMENT SAWCUT
- REMOVE
- REMOVE CONDUIT
- REMOVE ELECTRIC, UNDERGROUND
- REMOVE FENCE
- REMOVE SANITARY SEWER
- REMOVE STORM SEWER
- FAA
- BOUNDARY (PROJECT /CONSTRUCTION LIMITS)
- (E) GRADE BREAK / DRAINAGE CHANNEL DELINEATION
- GAS
- ELECTRIC, OVERHEAD
- ELECTRIC, UNDERGROUND
- EXISTING CONTOUR LINES
- PROPOSED CONTOUR LINES
- FENCE
- FENCE (2)
- FIBER OPTIC CABLE
- FUEL LINE
- WETLANDS
- HAUL or TRAFFIC ROUTE
- PROPERTY LINE
- SANITARY SEWER
- SIGNAL CABLE, UNDERGROUND
- STORM SEWER / CULVERT
- UNDERDRAIN
- WATER
- VEGETATION
- SEDIMENT LOG
- SILT FENCE
- GRADING LIMITS
- FLOW LINE
- FIBER ROLL
- SILT FENCE
- PAVEMENT SAWCUT

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SAN LUIS OBISPO COUNTY AIRPORT (SBP) BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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1 09/29/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

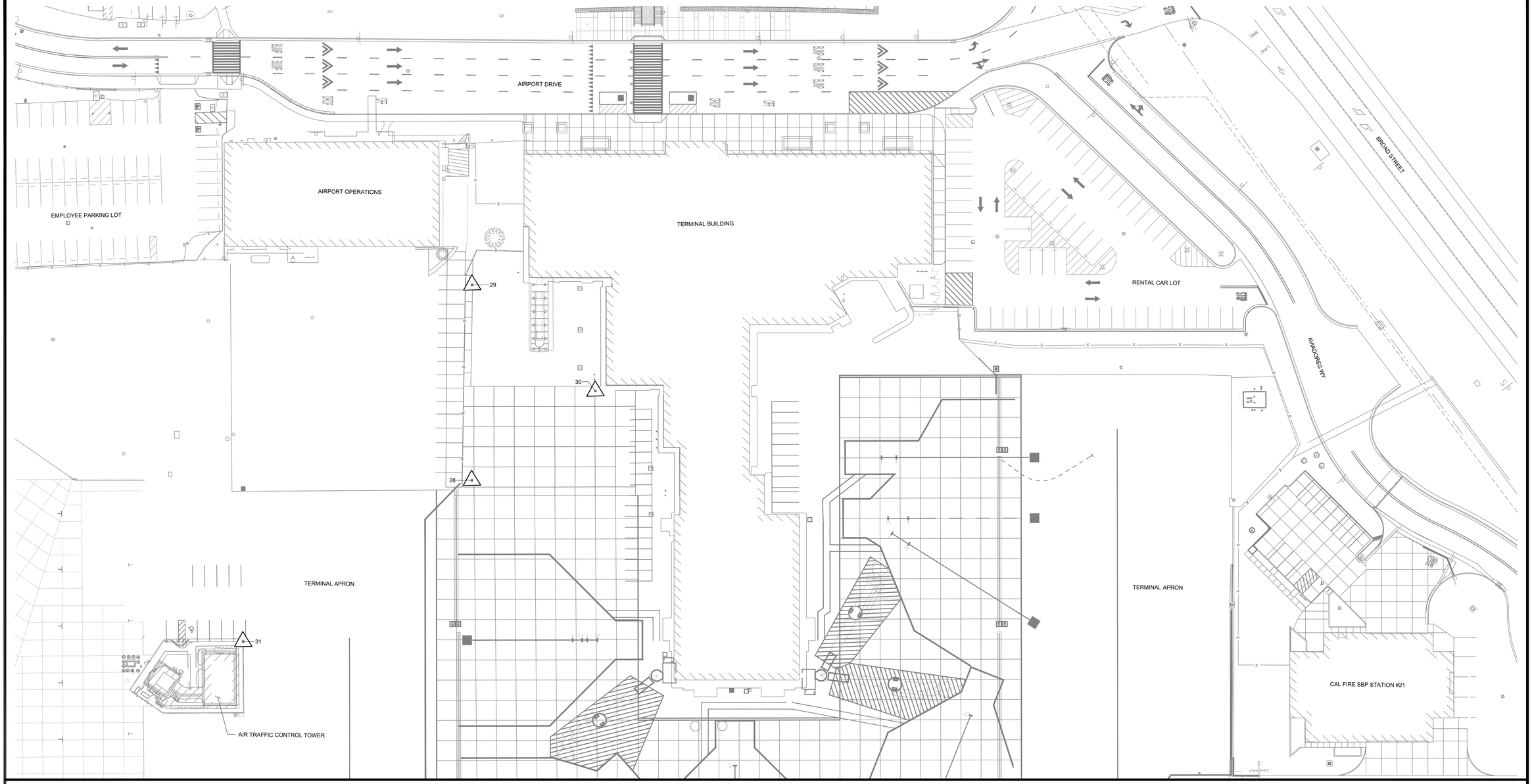
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DESIGNED BY: STK
DRAWN BY: STK
CHECKED BY: RPG
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SHEET CONTENTS
GENERAL CIVIL NOTES, LEGEND, AND ABBREVIATIONS

SHEET NO.
GC-001

LICENSED PROFESSIONAL ENGINEER
Rafael P. Gonzalez
C 74831
Exp. 12-31-27
Civil Engineer
STATE OF CALIFORNIA

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3/19/2026 11:21:46 AM



BASIS OF SURVEY:
SURVEY WAS PERFORMED BY TETRA TECH, INC. IN JANUARY 2024.

VERTICAL BENCHMARK STATEMENT
ELEVATIONS SHOWN HEREON ARE BASED UPON SAN LUIS OBISPO COUNTY, NGS DESIGNATION "SBP C", A FOUND 2" BRASS DISK MARKED "SLO COUNTY MON H-P" WITH A PUBLISHED ELEVATION OF 189.53' (NAVD 88).

BASIS OF COORDINATES AND BEARING:
THE COORDINATES AND BEARINGS SHOWN HEREON ARE BASED UPON THE CALIFORNIA COORDINATE SYSTEM OF CALIFORNIA, ZONE 5 NAD83, IN ACCORDANCE WITH THE CALIFORNIA PUBLIC RESOURCES CODE SECTION 8801-8819, SAID COORDINATES AND BEARINGS ARE BASED LOCALLY UPON FIELD-OBSERVED TIES TO NGS DESIGNATED MONUMENTS "PAC SBP C" AND "SAC SBP E." THE GRID BEARING BETWEEN STATIONS BEING N84°22'17.90"W AS DERIVED FROM THE SOURCE GEODETIC VALUES.

"SBP C" COORDINATES IN NAD83 STATE PLANE ZONE 5
N: 2282541.63
E: 5773204.32

LEGEND

△# SURVEY CONTROL POINT

CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
28	2283464.46	5773823.71	196.70	CPL 28 CUT X
29	2283609.89	5773827.97	197.95	CPL 29 CUT X
30	2283528.38	5773917.42	198.59	CPL 30 CUT X
31	2283349.29	5773650.26	196.53	CPL 31 CUT X

0 30 60

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

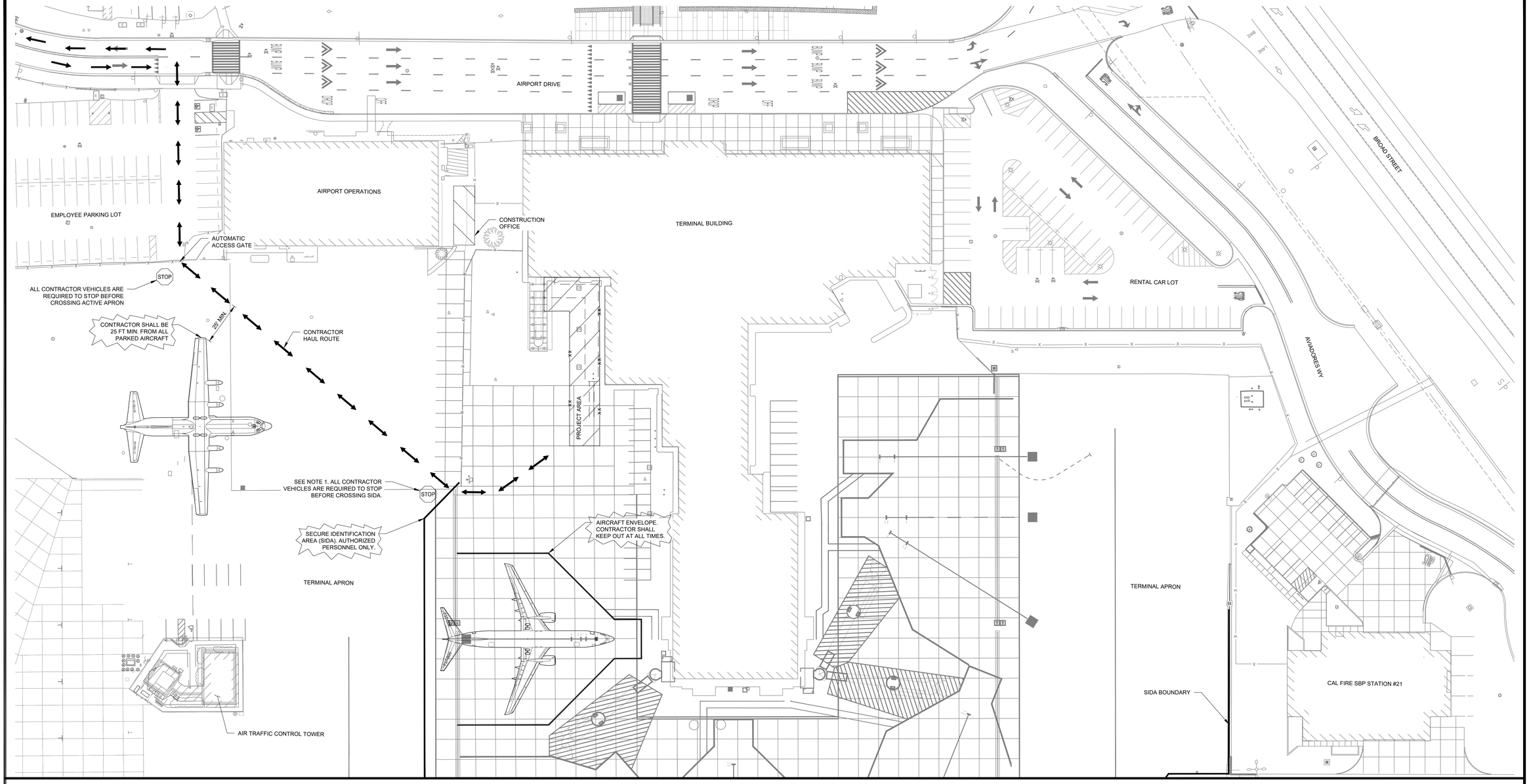
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SHEET CONTENTS
SURVEY CONTROL PLAN

SHEET NO.
GC-041

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CONSTRUCTION ACCESS NOTES:

1. ALL CONTRACTOR VEHICLES SHALL STOP AND BE INSPECTED BY AIRPORT OPERATIONS BEFORE ENTERING SIDA. CONTRACTOR VEHICLES SHALL NOT CROSS INTO SIDA WITHOUT PROPER AIRPORT APPROVAL.
2. ALL CONTRACTOR PERSONNEL SHALL NOT ENTER SIDA WITHOUT AIRPORT APPROVAL. PERSONNEL WORKING WITHIN SIDA MUST BE ESCORTED BY AN AUTHORIZED BADGE HOLDER AT ALL TIMES.
3. ARFF ACCESS SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL COORDINATE WITH AIRPORT TO CONFIRM APPROPRIATE ACCESS.
4. CONTRACTOR SHALL COORDINATE WITH AIRPORT FOR APRON ACCESS UNDER ACTIVE AIRCRAFT OPERATIONS.
5. BAGGAGE ACCESS FOR AIRLINE OPERATIONS SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL COORDINATE TEMPORARY BAGGAGE ACCESS WITH AIRPORT AND AIRLINE WORKERS.
6. CONTRACTOR SHALL REMAIN A MINIMUM OF 25 FEET AWAY FROM ALL PARKED AIRCRAFT. CONTRACTOR SHALL CONTACT AIRPORT OPERATIONS WITH ANY QUESTIONS OR CONCERNS.
7. CONTRACTOR SHALL REPAIR ALL ROUTES TO EXISTING CONDITION AS DETERMINED BY THE AIRPORT. REPAIRS TO BE INCIDENTAL TO CONSTRUCTION WORK.

CONSTRUCTION ACCESS LEGEND

- CONTRACTOR HAUL ROUTE
- PROJECT AREA
- CONSTRUCTION OFFICE
- LOW PROFILE BARRICADES
- x x — TEMPORARY CONSTRUCTION FENCE

0 30 60

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SAN LUIS OBISPO COUNTY AIRPORT (SBP) BAGGAGE SCREENING MODS.

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SAN LUIS OBISPO, CA 93401

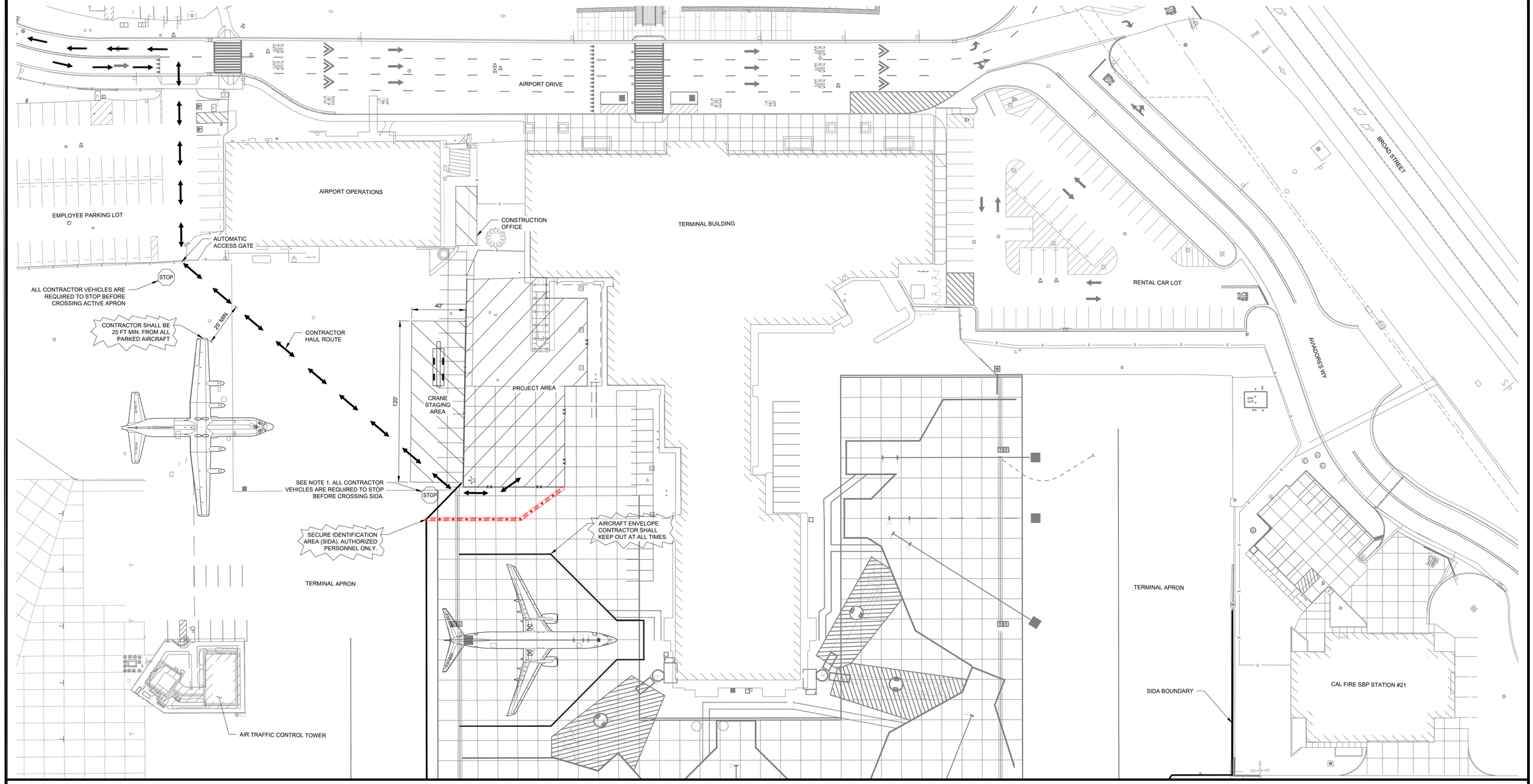
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SHEET CONTENTS
CONSTRUCTION ACCESS AND STAGING PLAN - PHASE 1

SHEET NO.
GC-081

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CONSTRUCTION ACCESS NOTES:

1. ALL CONTRACTOR VEHICLES SHALL STOP AND BE INSPECTED BY AIRPORT OPERATIONS BEFORE ENTERING SIDA. CONTRACTOR VEHICLES SHALL NOT CROSS INTO SIDA WITHOUT PROPER AIRPORT APPROVAL.
2. ALL CONTRACTOR PERSONNEL SHALL NOT ENTER SIDA WITHOUT AIRPORT APPROVAL. PERSONNEL WORKING WITHIN SIDA MUST BE ESCORTED BY AN AUTHORIZED BADGE HOLDER AT ALL TIMES.
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6. CONTRACTOR SHALL REMAIN A MINIMUM OF 25 FEET AWAY FROM ALL PARKED AIRCRAFT. CONTRACTOR SHALL CONTACT AIRPORT OPERATIONS WITH ANY QUESTIONS OR CONCERNS.
7. CONTRACTOR SHALL REPAIR ALL ROUTES TO EXISTING CONDITION AS DETERMINED BY THE AIRPORT. REPAIRS TO BE INCIDENTAL TO CONSTRUCTION WORK.

CONSTRUCTION ACCESS LEGEND

- CONTRACTOR HAUL ROUTE
- PROJECT AREA
- CRANE STAGING AREA
- LOW PROFILE BARRICADES
- x x TEMPORARY CONSTRUCTION FENCE

0 30 60

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SAN LUIS OBISPO COUNTY AIRPORT (SBP) BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
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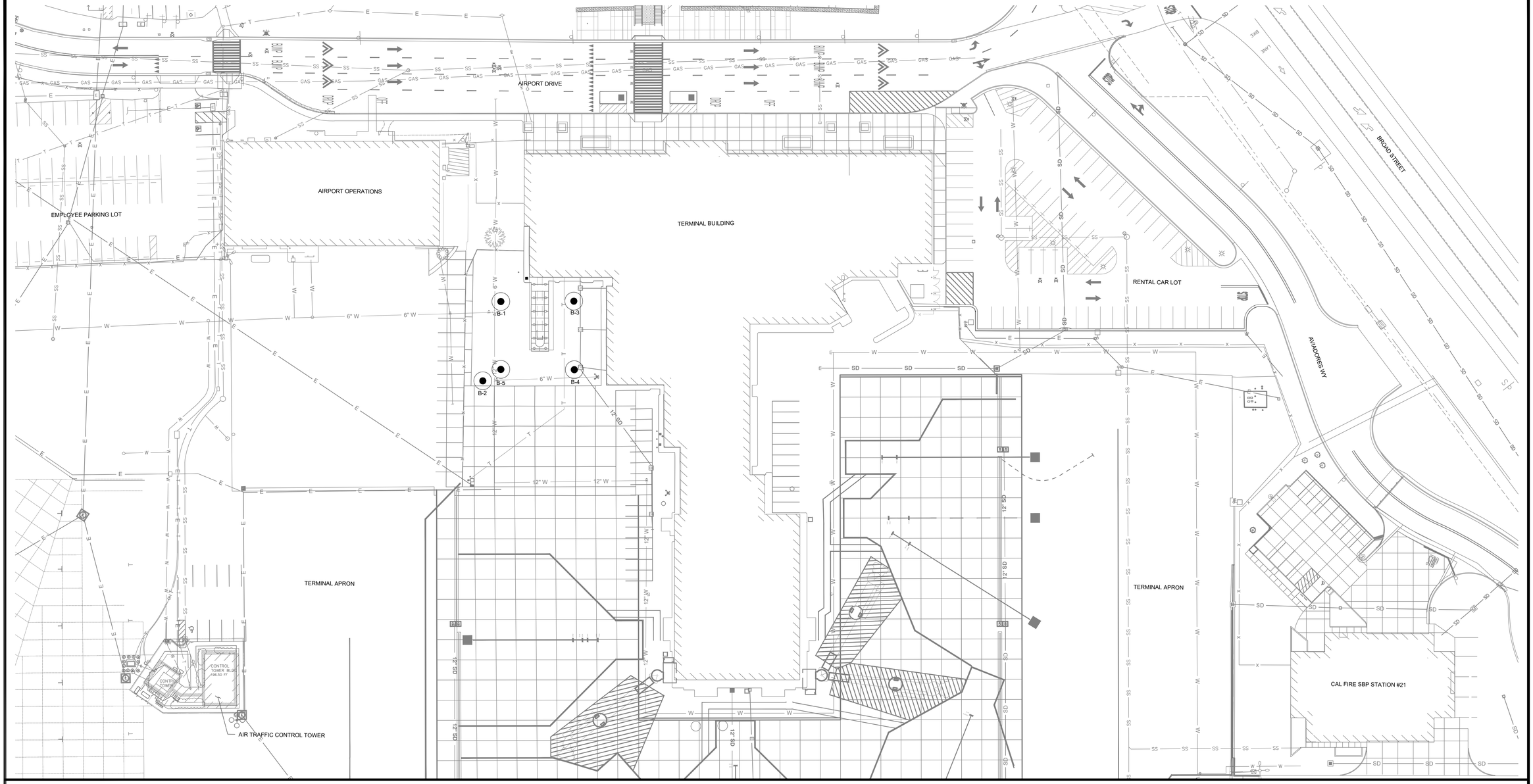
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SHEET CONTENTS
CONSTRUCTION ACCESS AND STAGING PLAN - PHASE 2

SHEET NO.
GC-082

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1/23/2026 9:29:26 AM



GEOTECHNICAL BORING NOTES:

B-1 BORING LOCATION (APPROX.) AS PROVIDED FROM GEOTECHNICAL REPORT TO SSG STRUCTURAL ENGINEERS FROM EARTH SYSTEMS PACIFIC DATED FEBRUARY 27, 2024

0 30 60

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SHEET CONTENTS
BORING PLAN

SHEET NO.
B-051

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Earth Systems Pacific

Boring No. 4
PAGE 1 OF 1
JOB NO.: 304536-011
DATE: 01/25/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.5" ASPHALT CONCRETE / 9.0" AGGREGATE BASE					
1	CL		SANDY LEAN CLAY: bluish gray, stiff, very moist (Fill)	1.0 - 3.0	○			
3	CH		SANDY FAT CLAY: dark grayish brown, stiff, very moist (Alluvium)					
5				5.0 - 6.5	■	95.5	27.4	5 11 22
7	SC		CLAYEY SAND: dark yellowish brown, medium dense, slightly moist (Older Alluvium)					
9			trace gravel	10.0 - 11.5	●			7 17 17
11	CL		SANDY LEAN CLAY: dark yellowish brown, very stiff, slightly moist					
15				15.0 - 16.5	●			6 7 16
16	SC		CLAYEY SAND: olive brown, medium dense, slightly moist, trace gravel					
			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 3
PAGE 1 OF 2
JOB NO.: 304536-011
DATE: 01/24/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.5" ASPHALT CONCRETE / 11.0" AGGREGATE BASE					
2	SP		POORLY GRADED SAND: brown, medium dense, moist (Fill)					
3	CH		SANDY FAT CLAY: dark grayish brown, stiff, very moist, trace hydrocarbon odor (Alluvium)	3.5 - 5.0	○			
5				5.0 - 6.5	■	98.7	21.3	3 4 6
9	SC		CLAYEY SAND: dark yellowish brown, medium dense, slightly moist, trace gravel (Older Alluvium)	10.0 - 11.5	■	100.9	21.5	8 17 32
15				15.0 - 16.5	●			7 11 14
19			light yellowish brown, moist	20.0 - 21.3	●			23 29 50/3"
21			very dense, slightly moist					
23			dark yellowish brown, moist					
25			light yellowish brown, slightly moist	25.0 - 25.9	●			5 50/5"

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 2
PAGE 1 OF 2
JOB NO.: 304536-011
DATE: 01/24/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			4.5" ASPHALT CONCRETE / 11.0" AGGREGATE BASE					
1	CL		SANDY LEAN CLAY: pale brown, stiff, very moist, trace gravel (Fill)	1.5 - 3.5	○			
3	CL		SANDY LEAN CLAY: dark grayish brown, stiff, very moist (Alluvium)					
5	CL		SANDY LEAN CLAY: very light yellowish brown, stiff, very moist (Older Alluvium)	5.0 - 6.0	■	94.0	24.3	10 50/6"
9	SC		CLAYEY SAND WITH GRAVEL: dark yellowish brown with red and black mottling, dense, moist	10.0 - 11.5	●			8 16 21
15	CL		SANDY LEAN CLAY: dark yellowish brown, very stiff, very moist	15.0 - 16.5	●			6 12 12
19			light yellowish brown, slightly moist	20.0 - 21.5	●			18 25 43
23	SC		CLAYEY SAND: dark yellowish brown, medium dense, moist	23.0 - 24.5	●			6 13 15

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

BORING LOG LEGEND

SAMPLE / SUBSURFACE WATER SYMBOLS	GRAPH SYMBOL
CALIFORNIA MODIFIED	■
STANDARD PENETRATION TEST (SPT)	●
SHELBY TUBE	▭
BULK	◯
SUBSURFACE WATER DURING DRILLING	▼
SUBSURFACE WATER AFTER DRILLING	▽

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

MAJOR DIVISIONS	GROUP SYMBOL	TYPICAL DESCRIPTIONS	GRAPH SYMBOL
COARSE GRAINED SOILS: MORE THAN 50% RETAINED ON NO. 200 SIEVE	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GP	POORLY GRADED GRAVELS, OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES	
	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
	SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES	
FINE GRAINED SOILS: MORE THAN 50% PASSING NO. 200 SIEVE	ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

OBSERVED MOISTURE CONDITION

DRY	SLIGHTLY MOIST	MOIST	VERY MOIST	WET (SATURATED)

CONSISTENCY

COARSE GRAINED SOILS			FINE GRAINED SOILS		
BLOWS/FOOT		DESCRIPTIVE TERM	BLOWS/FOOT		DESCRIPTIVE TERM
SPT	CA SAMPLER		SPT	CA SAMPLER	
0-10	0-16	LOOSE	0-2	0-3	VERY SOFT
11-30	17-50	MEDIUM DENSE	3-4	4-7	SOFT
31-50	51-83	DENSE	5-8	8-13	MEDIUM STIFF
OVER 50	OVER 83	VERY DENSE	9-15	14-25	STIFF
			16-30	26-50	VERY STIFF
			OVER 30	OVER 50	HARD

GRAIN SIZES

U.S. STANDARD SERIES SIEVE					CLEAR SQUARE SIEVE OPENING	
# 200	# 40	# 10	# 4	3/4"	3"	12"

SILT & CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

TYPICAL BEDROCK HARDNESS

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
EXTREMELY HARD	CORE, FRAGMENT, OR EXPOSURE CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CAN ONLY BE CHIPPED WITH REPEATED HEAVY HAMMER BLOWS
VERY HARD	CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK, CORE OR FRAGMENT BREAKS WITH REPEATED HEAVY HAMMER BLOWS
HARD	CAN BE SCRATCHED WITH KNIFE OR SHARP PICK WITH DIFFICULTY (HEAVY PRESSURE); HEAVY HAMMER BLOW REQUIRED TO BREAK SPECIMEN
MODERATELY HARD	CAN BE GROOVED 1/16 INCH DEEP BY KNIFE OR SHARP PICK WITH MODERATE OR HEAVY PRESSURE; CORE OR FRAGMENT BREAKS WITH LIGHT HAMMER BLOW OR HEAVY MANUAL PRESSURE
SOFT	CAN BE GROOVED OR GOUGED EASILY BY KNIFE OR SHARP PICK WITH LIGHT PRESSURE; CAN BE SCRATCHED WITH FINGERNAIL; BREAKS WITH LIGHT TO MODERATE MANUAL PRESSURE
VERY SOFT	CAN BE READILY INDENTED, GROOVED OR GOUGED WITH FINGERNAIL, OR CARVED WITH KNIFE; BREAKS WITH LIGHT MANUAL PRESSURE

TYPICAL BEDROCK WEATHERING

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
UNWEATHERED	NO DISCOLORATION, NOT OXIDIZED
SLIGHTLY WEATHERED	DISCOLORATION OR OXIDATION IS LIMITED TO SURFACE OF, OR SHORT DISTANCE FROM, FRACTURES; SOME FELDSPAR CRYSTALS ARE DULL
MODERATELY WEATHERED	DISCOLORATION OR OXIDATION EXTENDS FROM FRACTURES, USUALLY THROUGHOUT; Fe-Mg MINERALS ARE "ROTTY" FELDSPAR CRYSTALS ARE "CLOUDY"
HIGHLY WEATHERED	DISCOLORATION OR OXIDATION THROUGHOUT; FELDSPAR AND Fe-Mg MINERALS ARE ALTERED TO CLAY TO SOME EXTENT, OR CHEMICAL ALTERATION PRODUCES IN SITU DISAGGREGATION
DECOMPOSED	DISCOLORATION OR OXIDATION THROUGHOUT, BUT RESISTANT MINERALS SUCH AS QUARTZ MAY BE UNALTERED; FELDSPAR AND Fe-Mg MINERALS ARE COMPLETELY ALTERED TO CLAY

Earth Systems Pacific Log Legend 2021.dwg

Earth Systems Pacific

Boring No. 5
PAGE 1 OF 1
JOB NO.: 304536-011
DATE: 01/25/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.0" ASPHALT CONCRETE / 12.0" AGGREGATE BASE					
1	CL		SANDY LEAN CLAY WITH GRAVEL: bluish gray, stiff, very moist (Fill)	3.0 - 5.0	○			
3	CH		SANDY FAT CLAY: dark grayish brown, stiff, very moist (Alluvium)					
5				5.0 - 6.5	■	97.7	25.8	4 9 42
7	CL		SANDY LEAN CLAY: very light yellowish brown, hard, slightly moist (Older Alluvium)					
9	SC		CLAYEY SAND WITH GRAVEL: dark yellowish brown with green and red mottling, dense, slightly moist	10.0 - 11.5	●			15 14 20
13	CL		SANDY LEAN CLAY: dark yellowish brown, very stiff, slightly moist					
15				15.0 - 16.5	●			3 7 10
			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 3
PAGE 2 OF 2
JOB NO.: 304536-011
DATE: 01/24/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT 8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
28	SC		CLAYEY SAND: same as above					
30				30.0 - 31.5	●			10 27 50/6"
31			CLAYEY SAND WITH GRAVEL: dark yellowish brown with white and red mottling, very dense, moist					
			End of Boring @ 31.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 2
PAGE 2 OF 2
JOB NO.: 304536-011
DATE: 01/24/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT 8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
28	SC		CLAYEY SAND: same as above					
30			olive brown with red mottling	30.0 - 31.1	●			13 44 50/1"
31			SANDSTONE: light yellowish brown, moderately hard, slightly moist, slightly weathered (Franciscan Melange)					
			End of Boring @ 31.1' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 1
PAGE 1 OF 1
JOB NO.: 304536-011
DATE: 01/24/2024

LOGGED BY: A. Flynn
DRILL RIG: GTech GT8 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

San Luis Obispo County Airport
Outbound Baggage Expansion
975 Airport Drive
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.5" ASPHALT CONCRETE / 12.0" AGGREGATE BASE					
1	CL		SANDY LEAN CLAY: pale brown, medium stiff, very moist (Fill)	1.5 - 4.0	○			
4	SP-SC		POORLY GRADED SAND WITH CLAY: pale brown, medium dense, very moist (Fill)					
5	CH		SANDY FAT CLAY: dark grayish brown, stiff, moist (Alluvium)	5.0 - 6.5	■	103.5	18.3	5 8 12
8	CL		SANDY LEAN CLAY: light yellowish brown, hard, moist (Older Alluvium)					
10			slightly moist	10.0 - 11.5	■	87.0	23.7	6 34 23
15			very moist	15.0 - 16.5	●			19 16 17
			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT
NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

NOTES:

1. INFORMATION PROVIDED IS BASED ON GEOTECHNICAL BORINGS PERFORMED BY EARTH SYSTEMS PACIFIC ON 1/24/2024 AND 1/25/2024.
2. GEOTECHNICAL REPORT WAS PREPARED FOR SSG STRUCTURAL ENGINEERS BY EARTH SYSTEMS PACIFIC.

LICENSED PROFESSIONAL ENGINEER
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C 74831
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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

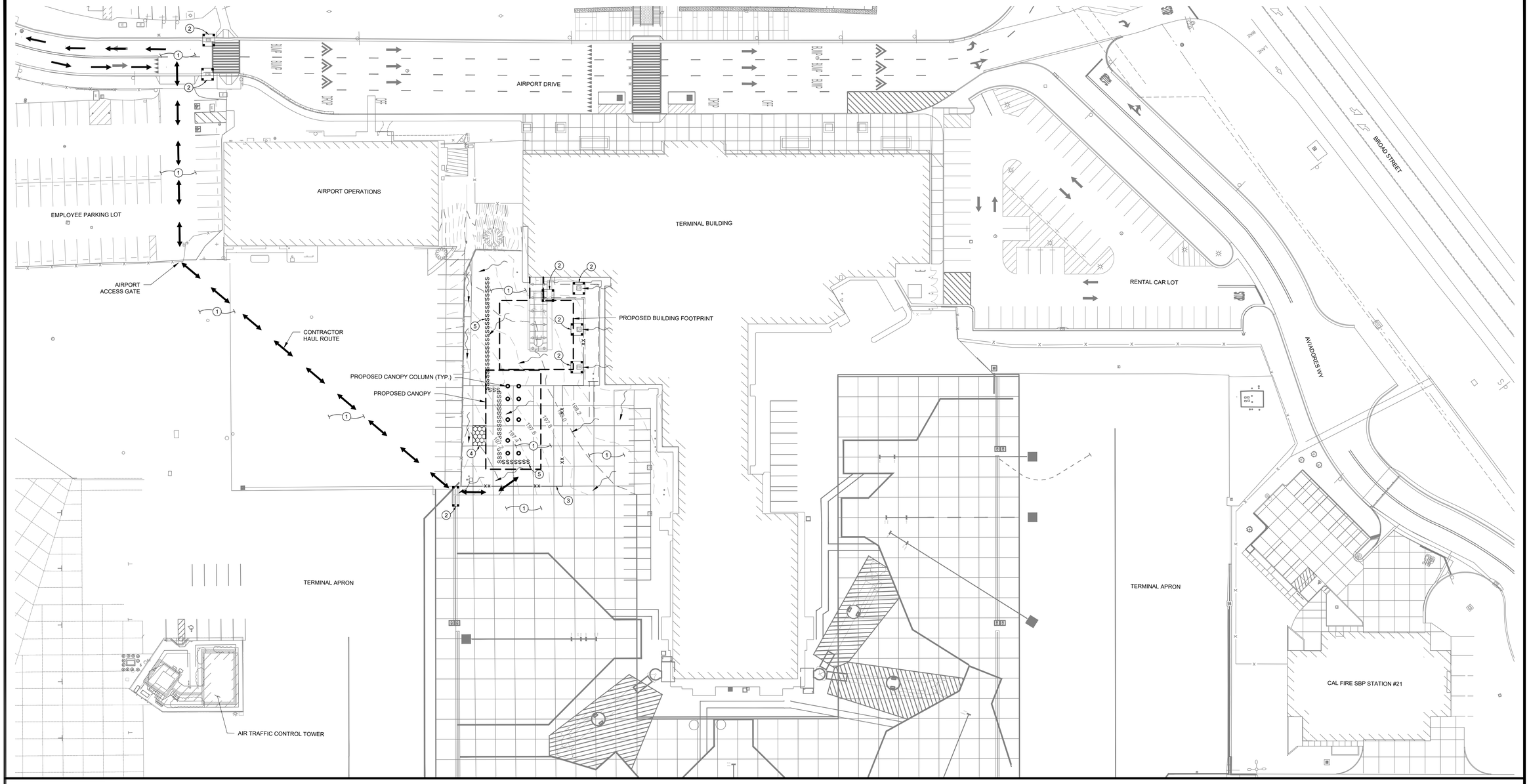
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1 09/29/25 PERMIT REVISIONS
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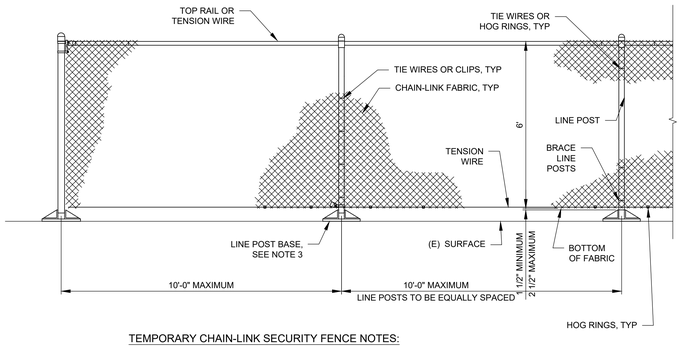
M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: STK
DRAWN BY: STK
CHECKED BY: RPG
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SHEET CONTENTS
BORING LOGS

SHEET NO.
B-052

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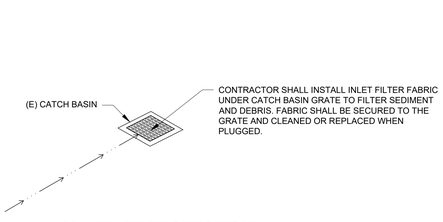
TEMPORARY CHAIN-LINK SECURITY FENCE NOTES:

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION THAT COMPLY WITH AIRPORT REQUIREMENTS.
2. TEMPORARY FENCING SHALL BE APPROVED BY THE AIRPORT.
3. WIRE TIES, RAILS, AND POSTS SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE SIDE OPPOSITE THE SECURE AREA.
4. FENCE SHALL BE WEIGHTED AND SECURED AGAINST HIGH WINDS.

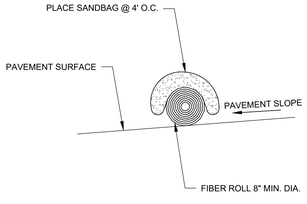
2 TEMPORARY FENCE DETAIL
NOT TO SCALE

GENERAL EROSION CONDITIONS NOTES.

1. IN GENERAL, THE CONTRACTOR SHALL COMPLY WITH ALL EROSION AND SILTATION CONTROL MEASURES AND PRACTICES DESCRIBED IN THE CALIFORNIA STORMWATER BMP HANDBOOK, CONSTRUCTION, PUBLISHED BY THE CALIFORNIA STORMWATER QUALITY ASSOCIATION (CURRENT EDITION).
2. THE CONTRACTOR SHALL INSTALL A STABILIZED CONSTRUCTION ENTRANCE/EXIT WHERE IDENTIFIED ON THE EROSION CONTROL PLANS. COORDINATE PRECISE LOCATIONS WITH THE RPR DURING OR PRIOR TO THE PRE-CONSTRUCTION MEETING.
3. THE CONTRACTOR SHALL INSTALL ALL APPROPRIATE STORMWATER, EROSION, AND SILTATION CONTROL MEASURES AS REQUIRED FOR STAGING, STOCKPILE, OR STORAGE LOCATIONS. NO SEPARATE PAYMENT SHALL BE MADE FOR MEASURES IN STAGING, STOCKPILE, OR STORAGE LOCATIONS FOR THE COSTS SHALL BE CONSIDERED INCIDENTAL TO THE WORK INVOLVED AND INCLUDED IN THE COST TO MOBILIZE AND COMPLY WITH POLLUTION, EROSION, AND SILTATION CONTROL.
4. STAGING AREAS TO BE RESTORED TO MATCH EXISTING CONDITIONS.
5. SERVICING AND FUELING OF CONSTRUCTION VEHICLES WILL BE ACCOMPLISHED WITH USE OF THE FOLLOWING BEST MANAGEMENT PRACTICES:
   - SERVICING AND FUELING WILL TAKE PLACE AS FAR AS PRACTICAL FROM WATERWAYS AND DRAINAGE FEATURES
   - WHEN FUELING, TANKS WILL NOT BE TOPPED OFF
   - SECONDARY CONTAINMENT, SUCH AS A DRAIN PAN OR DRAIN CLOTH, WILL BE USED WHEN FUELING TO CATCH SPILLS OR LEAKS
   - STORAGE OF HAZARDOUS MATERIALS WILL BE AS FAR AS PRACTICAL FROM WATERWAYS AND DRAINAGE FEATURES
6. CONTRACTOR SHALL MAINTAIN AIRLINE ACCESS TO TEMPORARY BAGGAGE SYSTEM THROUGHOUT CONSTRUCTION.



2 INLET PROTECTION
NOT TO SCALE



1 TEMPORARY FIBER ROLL DETAIL
NOT TO SCALE

EROSION CONTROL NOTES:

1. PROVIDE CONTINUAL SWEEPING PER CASQA SE-7
2. PROVIDE INLET PROTECTION PER DETAIL 2/C-021
3. CONSTRUCT TEMPORARY CONSTRUCTION FENCE AND ACCESS GATE, PER DETAIL 3/C-021
4. PROVIDE TEMPORARY CONCRETE WASHOUT PER CASQA WM-8
5. PROVIDE TEMPOROARY FIBER ROLL PER DETAIL 1/C-021

EROSION CONTROL LEGEND

- CONCRETE WASHOUT
- INLET PROTECTION
- xx TEMPORARY CONSTRUCTION FENCE
- SSSSSSSSSSSSS TEMPORARY FIBER ROLL
- EXISTING SURFACE FLOW
- CONTRACTOR HAUL ROUTE

0 30 60

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SAN LUIS OBISPO COUNTY AIRPORT (SBP) BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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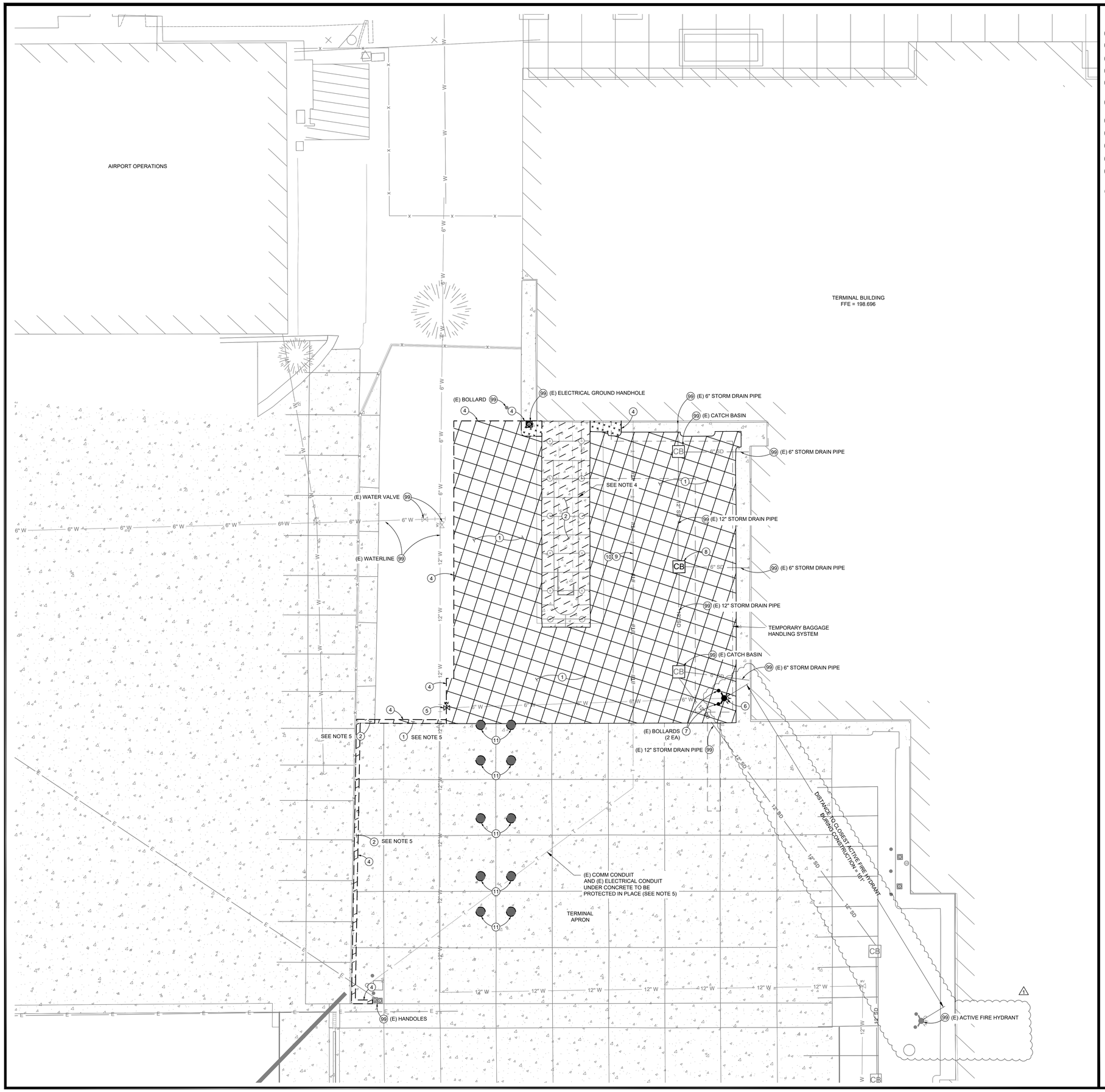
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SHEET CONTENTS
EROSION CONTROL PLAN

SHEET NO.
C-021

LICENSED PROFESSIONAL ENGINEER
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C 74831
Exp. 12-31-27
Civil Engineering
STATE OF CALIFORNIA

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DEMOLITION ITEMS

1. DEMOLISH (E) ASPHALT CONCRETE PAVEMENT
2. DEMOLISH (E) CONCRETE PAVEMENT
3. DEMOLISH (E) CONCRETE SIDEWALK
4. SAWCUT PAVEMENT EDGE
5. DEMOLISH (E) VALVE BOX AND PROTECT VALVE IN PLACE. TO BE REINSTALLED PER DETAIL 2/C-501
6. REMOVE, SALVAGE, AND CAP (E) FIRE HYDRANT. TO BE REINSTALLED PER SHEET C-401
7. REMOVE (E) BOLLARDS
8. REMOVE (E) CATCH BASIN
9. DEMOLISH (E) COMMUNICATION AND CABLE
10. DEMOLISH (E) ELECTRICAL CONDUIT
11. DRILL 30" DIA. PER STRUCTURAL SHEET S-102 AND DETAIL 53/S-502

99 PROTECT IN PLACE

HATCH LEGEND

- DEMOLISH CONCRETE PAVEMENT
- DEMOLISH ASPHALT CONCRETE PAVEMENT
- DEMOLISH SIDEWALK
- SAWCUT PAVEMENT EDGE
- DEMOLISH COMMUNICATIONS LINE

GENERAL DEMOLITION NOTES:

1. CONTRACTOR SHALL NOT BEGIN EXCAVATION UNTIL ALL EXISTING UNDERGROUND UTILITIES WITHIN THE PROJECT AREA HAVE BEEN MARKED IN THE FIELD BY THE CONTRACTOR . THE CONTRACTOR SHALL DETERMINE EXACT LOCATIONS AND DEPTHS FROM AVAILABLE RESOURCES AND OTHER APPROPRIATE MEANS OF DETECTION. THE CONTRACTOR SHALL USE CAUTION DURING DEMOLITION TO NOT DAMAGE EXISTING PAVEMENTS, UTILITIES, OR ITEMS TO REMAIN. ANY DAMAGE TO EXISTING ITEMS NOT SHOWN FOR REMOVAL SHALL BE REPAIRED OR REPLACED IN-KIND AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE AIRPORT. NO SEPARATE COMPENSATION FOR ASSOCIATED DELAYS OR COSTS WILL BE ACCEPTED.
2. ALL EXISTING UTILITIES AND ITEMS NOT LABELED TO BE REMOVED ARE TO REMAIN AND BE PROTECTED THROUGHOUT CONSTRUCTION.
3. REMOVAL LIMITS FOR CONCRETE SIDEWALKS SHALL FOLLOW LOCATION OF (E) CONSTRUCTION JOINTS.
4. CONTRACTOR SHALL REFER TO ARCHITECTURE SHEET AD-101 FOR EXISTING CANOPY AND BAGGAGE SYSTEM REMOVAL.
5. IF EXISTING TELECOMMUNICATION CONDUITS ARE IMPACTED BY THE CONSTRUCTION OF THE CANOPY FOUNDATION, THE CONTRACTOR SHALL DEMOLISH CONCRETE AND ASPHALT PAVEMENTS REQUIRED TO RE-ROUTE A NEW TELECOMMUNICATION DUCT BANK TO THE TERMINAL BUILDING. CONDUITS CAN ALSO BE INSTALLED USING A DIRECTIONAL BORE.

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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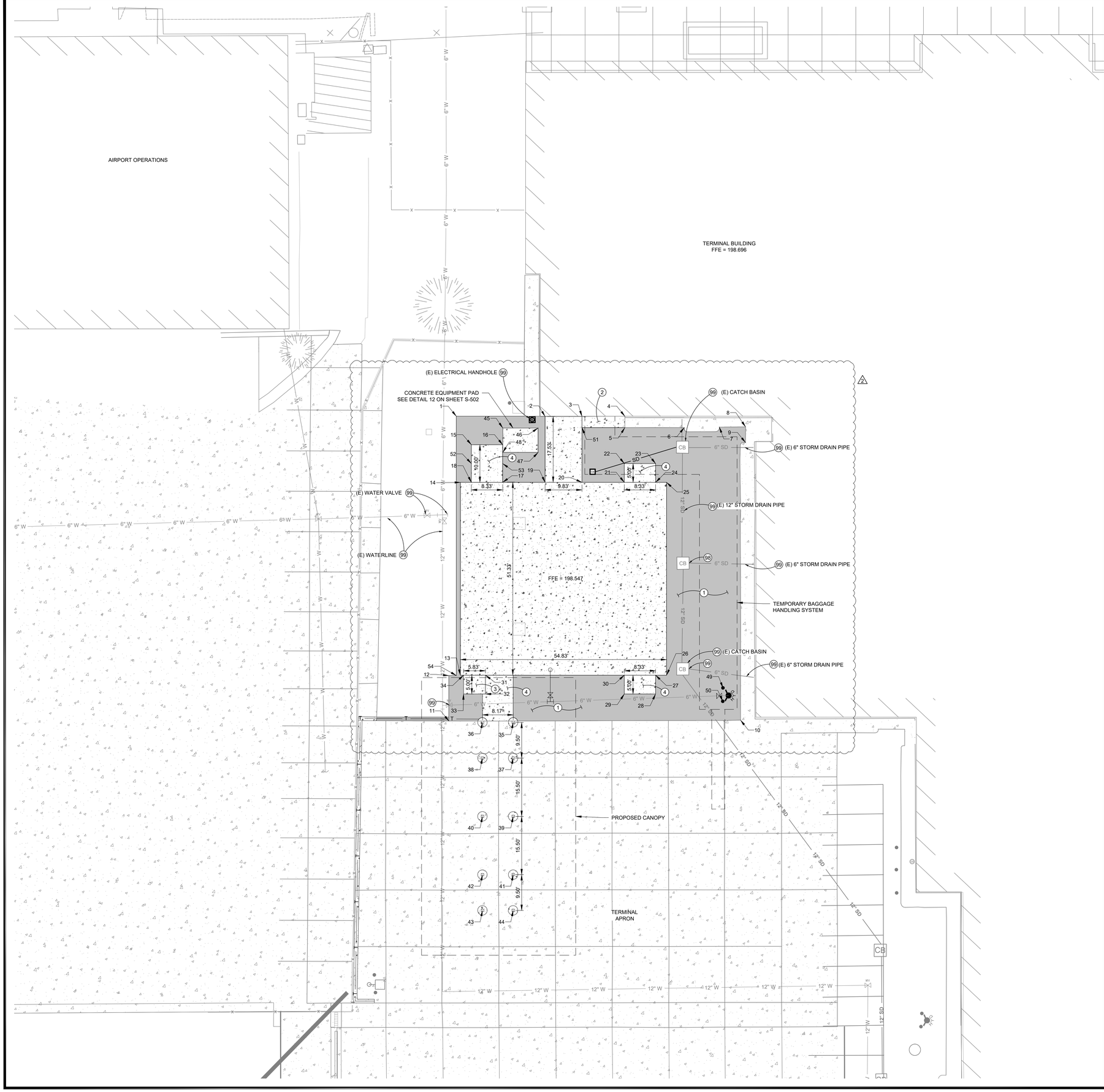
LICENSED PROFESSIONAL ENGINEER
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C 74831
Exp. 12-31-27
Civil Engineer
STATE OF CALIFORNIA

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
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SHEET CONTENTS:
DEMOLITION PLAN

SHEET NO.
C-051

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CONSTRUCTION ITEMS

1. CONSTRUCT (N) ASPHALT CONCRETE PAVEMENT PER DETAIL 2/C-311
2. CONSTRUCT (N) CONCRETE LANDING PER DETAIL 1A/C-311
3. CONSTRUCT (N) CONCRETE LANDING WITH STEP PER DETAIL 10/C-311
4. CONSTRUCT (N) CONCRETE SLAB ON GRADE PER DETAIL 1B/C-311
98. ADJUST CATCH BASIN TO GRADE, SEE SHEET C-201
99. PROTECT IN PLACE

LEGEND

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE
- EXISTING CONCRETE PAVEMENT

GENERAL DEMOLITION NOTES:

1. CONTRACTOR SHALL POTHOLE TO VERIFY THE DEPTH OF (E) UTILITIES PRIOR TO CONSTRUCTION.
2. WORK SHALL BE PERFORMED IN ACCORDANCE WITH CONSTRUCTION SAFETY AND PHASING PLANS. SEE "GC-" SERIES SHEETS.
3. CONTRACTOR SHALL VERIFY LOCATION OF THE PROPOSED BUILDING LAYOUT IN RELATION TO THE EXISTING TERMINAL BUILDING. (2)

(2)

POINT TABLE			
POINT #	NORTHING	EASTING	ELEVATION
1	2283614.81	5773848.26	198.21
2	2283614.11	5773871.83	198.70
3	2283613.83	5773881.66	198.70
4	2283613.56	5773893.06	198.63
5	2283610.55	5773892.98	198.59
6	2283610.11	5773908.77	198.61
7	2283610.00	5773918.08	198.60
8	2283609.86	5773925.07	198.61
9	2283605.68	5773924.95	198.61
10	2283531.94	5773921.56	198.63
11	2283533.89	5773844.00	197.53
12	2283545.96	5773844.33	197.53
13	2283545.98	5773847.42	198.55
14	2283597.21	5773848.85	198.55
15	2283607.13	5773852.04	198.35
16	2283606.89	5773860.37	198.90
17	2283596.90	5773860.09	198.55
18	2283597.13	5773851.76	198.55
19	2283596.58	5773871.34	198.55
20	2283596.31	5773881.17	198.55
21	2283596.00	5773892.42	198.55
22	2283600.99	5773892.56	198.45
23	2283600.76	5773900.89	198.45
24	2283595.76	5773900.75	198.55
25	2283595.68	5773903.66	198.55
26	2283544.45	5773902.23	198.55
27	2283544.53	5773899.31	198.55

POINT TABLE			
POINT #	NORTHING	EASTING	ELEVATION
28	2283539.53	5773899.18	198.45
29	2283539.77	5773890.85	198.45
30	2283544.77	5773890.98	198.55
31	2283545.80	5773854.08	198.55
32	2283540.80	5773853.94	198.45
33	2283540.96	5773848.11	198.45
34	2283545.96	5773848.25	198.55
35	2283533.04	5773861.10	N/A
36	2283533.27	5773852.94	N/A
37	2283523.55	5773860.84	N/A
38	2283523.77	5773852.67	N/A
39	2283508.05	5773860.41	N/A
40	2283508.28	5773852.24	N/A
41	2283492.56	5773859.97	N/A
42	2283492.79	5773851.81	N/A
43	2283483.28	5773851.54	N/A
44	2283483.06	5773859.71	N/A
45	2283611.35	5773860.50	198.92
46	2283611.09	5773869.91	198.92
47	2283604.59	5773869.73	198.92
48	2283604.85	5773860.32	198.92
49	2283540.64	5773917.13	198.53
50	2283537.08	5773916.98	198.56
51	2283610.87	5773881.58	198.67
52	2283602.13	5773851.90	198.45
53	2283601.90	5773860.23	198.45
54	2283545.91	5773846.33	197.56

0 10 20

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

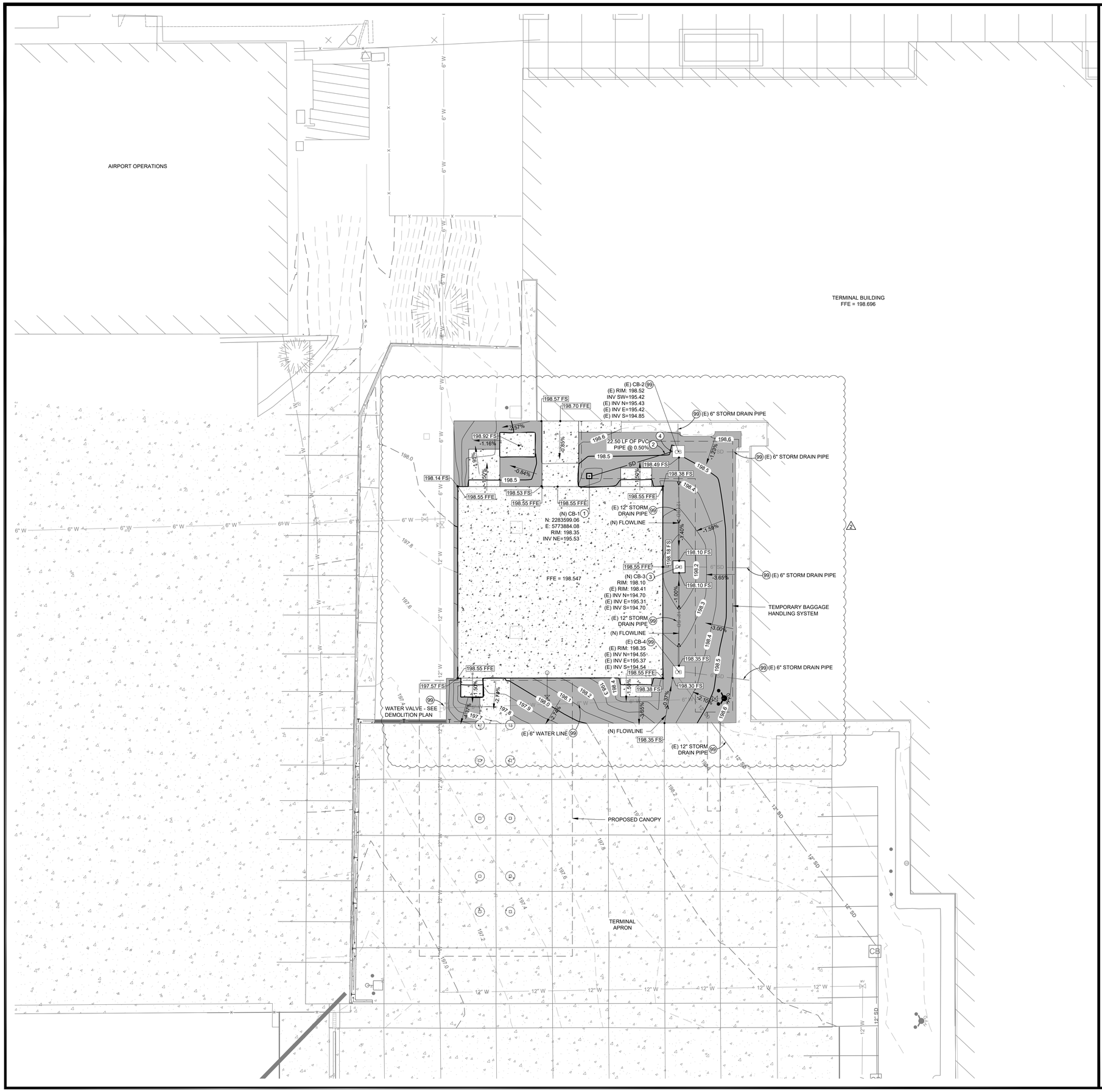
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M&H NO.: 1943000-222814.02
DATE: January 26, 2026
DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RPG
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL SITE PLAN

SHEET NO.
C-101

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1/23/2026 8:30:39 AM



GRADING AND DRAINAGE ITEMS

1. CONSTRUCT (N) 18" X 18" PRECAST CATCH BASIN PER DETAIL 9/C-311
2. CONSTRUCT (N) 12" PVC STORM DRAIN PIPE PER DETAIL 8/C-311
3. INSTALL (N) CATCH BASIN TO GRADE PER DETAIL 9/C-311
4. CONNECT (N) STORM DRAIN PIPE TO EXISTING CATCH BASIN PER DETAIL 7/C-311

99 PROTECT IN PLACE

LEGEND

- PROPOSED ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED CONCRETE
- PROPOSED FLOWLINE

GENERAL GRADING AND DRAINAGE NOTES:

1. (E) CONTOURS DEPICTED AT 0.2' INTERVALS. PROPOSED CONTOURS DEPICTED AT 0.1' INTERVALS.
2. CONTRACTOR SHALL FIELD VERIFY THE ELEVATIONS OF (E) INVERTS AND MATCHING PAVEMENT EDGES PRIOR TO START OF CONSTRUCTION.
3. MATCH (E) PAVEMENT AT ALL UTILITY TRENCH PATCHES WHERE PROPOSED CONTOURS ARE NOT SHOWN.
4. A SOIL OR CIVIL ENGINEER TO DETERMINE GRADING PERFORMED IS IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED PLANS AND IS SUITABLE TO SUPPORT THE INTENDED STRUCTURE(S).
5. FINAL REPORTS SHALL BE IN ACCORDANCE WITH TITLE 19.12.150 AND 19.12.160(A). (CBC 1704.6).

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975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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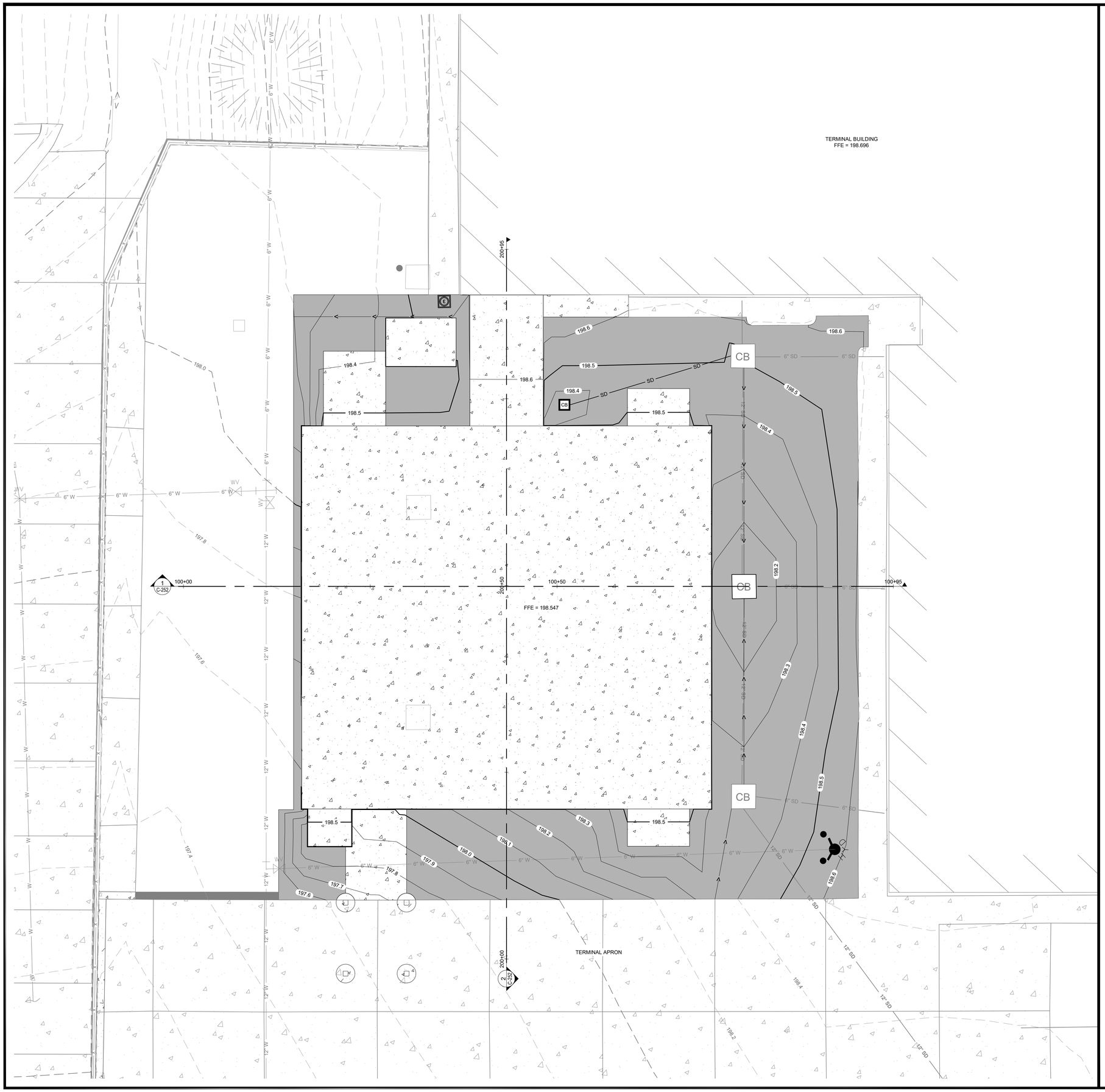
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SHEET CONTENTS
GRADING AND DRAINAGE

LICENSED PROFESSIONAL ENGINEER
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Civil Engineer
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SHEET NO.
C-201

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1/23/2026 8:30:19 AM



LEGEND

- PROPOSED ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED CONCRETE
- PROPOSED FLOWLINE

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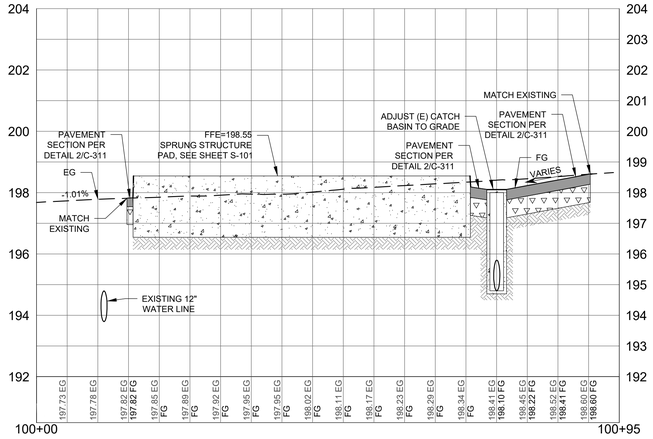
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SHEET CONTENTS
CROSS SECTION PLAN

LICENSED PROFESSIONAL ENGINEER
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C 74831
Exp. 12-31-27
Civil Engineer
STATE OF CALIFORNIA

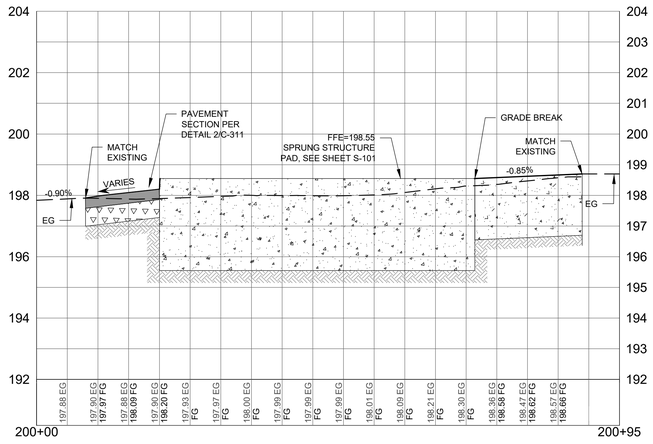
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C-251

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1/23/2026 8:39:37 AM



1 **SPRUNG STRUCTURE SECTION (LOOKING NORTH)**

HORIZONTAL SCALE: 1"=10' VERTCIAL SCALE: 1"=2'



2 **SPRUNG STRUCTURE SECTION (LOOKING EAST)**

HORIZONTAL SCALE: 1"=10' VERTCIAL SCALE: 1"=2'

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BAGGAGE SCREENING MODS.

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SAN LUIS OBISPO, CA 93401

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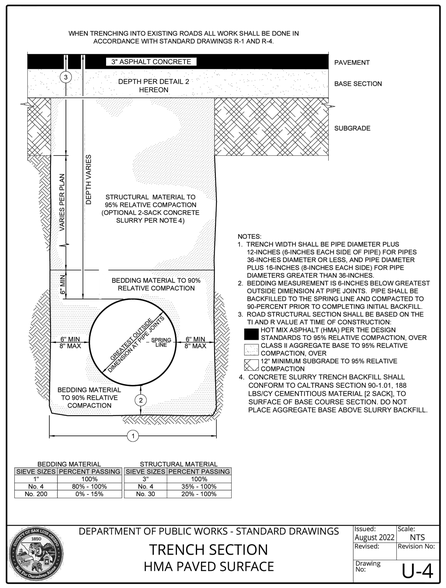
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SHEET CONTENTS
CROSS SECTIONS

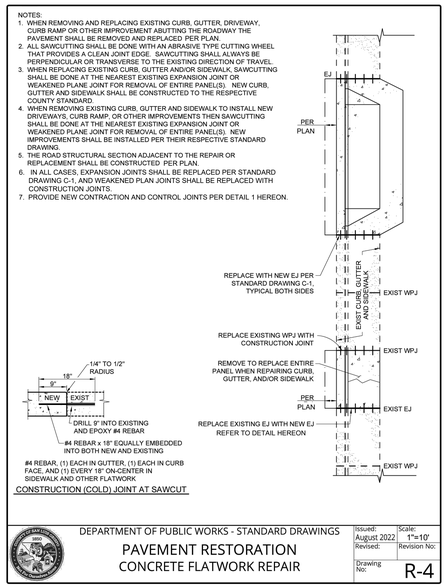
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SHEET NO:
C-252

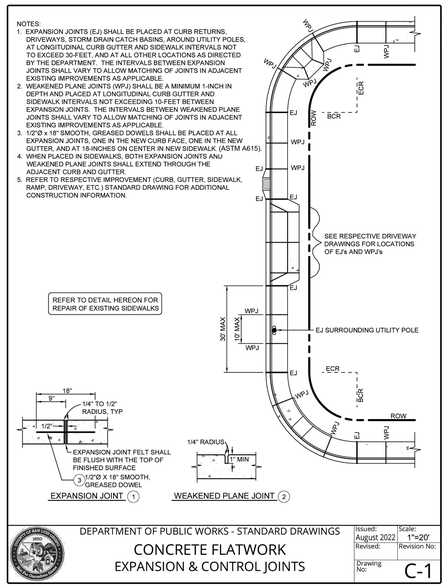
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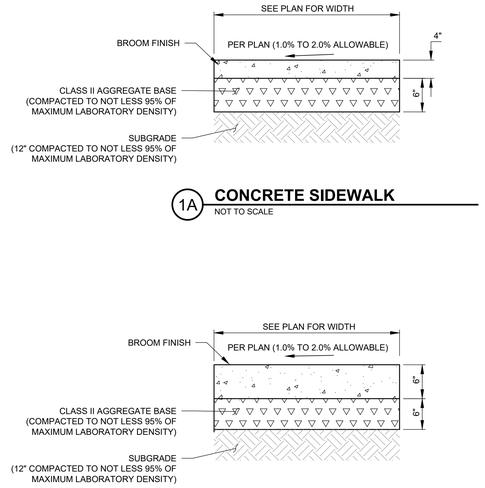


8 **STORM DRAIN TRENCH IN PAVED AREA**
NOT TO SCALE MODIFIED STD. DWG. U-4



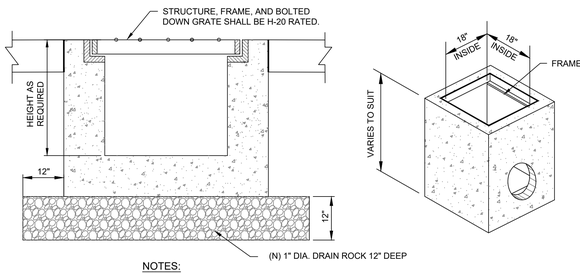
5 **EXPANSION AND CONTROL JOINTS DETAIL**
NOT TO SCALE MODIFIED STD. DWG. C-1 & R-4



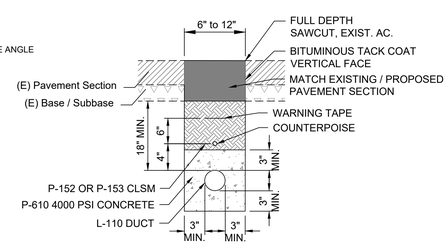


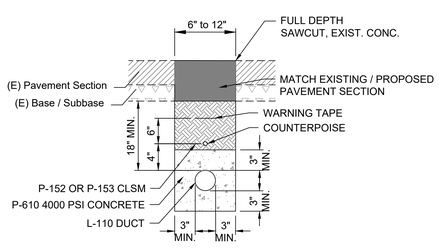
1A **CONCRETE SIDEWALK**
NOT TO SCALE

1B **CONCRETE SIDEWALK LANDING**
NOT TO SCALE



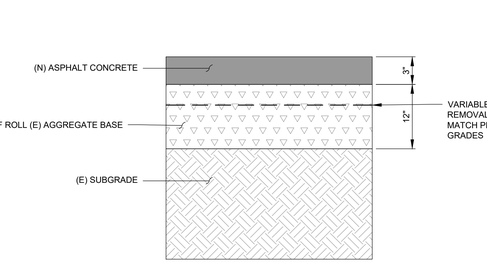
9 **PRE-CAST CATCH BASIN**
NOT TO SCALE



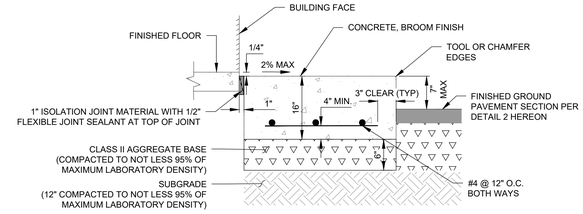


NOTES:
1. SIMILAR FOR SINGLE OR TRIPLE DUCTS. FOUR WAY DUCTS OR LARGER SHALL BE STACKED 2 X 2 OR 3 X 3.
2. DUCT UNDER NEW PAVEMENT SHALL BE INSTALLED BEFORE THE PAVEMENT.
3. COUNTERPOISE INSTALLATION PER SPECIFICATION L-108
4. FOR MULTIPLE DUCTS USE CONDUIT SPACERS WHEN ENCASED IN CONCRETE
5. ALL MATERIALS AND EFFORT REQUIRED FOR BACKFILLING OF TRENCHES SHALL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE TRENCH.

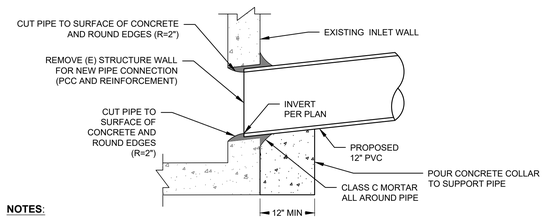
6 **PVC DUCT TRENCHING**
NOT TO SCALE



2 **FULL DEPTH ASPHALT PAVEMENT DETAIL**
NOT TO SCALE

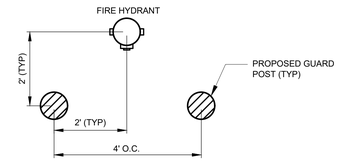


10 **CONCRETE LANDING WITH STEP DETAIL**
NOT TO SCALE



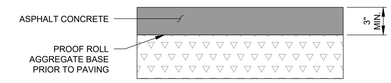
NOTES:
1. THE MINIMUM OPENING INTO THE EXISTING STRUCTURE SHALL BE THE OUTSIDE DIAMETER OF THE CONNECTING PIPE PLUS 1".

7 **PIPE CONNECTION TO EXISTING STORM DRAINS**
NOT TO SCALE



NOTES:
1. 4" DIA. PIPE, SCHEDULE 40 6' IN LENGTH WITH 3' OF PIPE ABOVE THE GROUND.
2. PAINT GUARD POST WITH ONE COAT OF ACRYLIC ALKYD ENAMEL PRIMER AND FINISH WITH TWO COATS OF GLOSS YELLOW ENAMEL PAINT.
3. INSTALL 6" WIDE WHITE REFLECTIVE TAPE.

4 **GUARD POST INSTALLATION DETAIL**
NOT TO SCALE



3 **ASPHALT PAVEMENT OVERLAY DETAIL**
NOT TO SCALE

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SAN LUIS OBISPO COUNTY AIRPORT (SBP) BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
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1 09/29/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
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CHECKED BY: RPG
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SHEET CONTENTS
CONSTRUCTION DETAILS

SHEET NO.
C-311

LICENSED PROFESSIONAL ENGINEER
Rafael P. Gonzalez
C 74831
Exp. 12-31-27
Civil Engineer
STATE OF CALIFORNIA

X:\1943000\222814.02\TECH\CAD\DRAWINGS\SHEETS\C-311 CONSTRUCTION DETAILS.DWG
1/23/2026 8:30:51 AM

SAN LUIS JET CENTER

TERMINAL BUILDING
FFE = 198.696

(99) (E) CATCH BASIN

(99) (E) 6" STORM DRAIN PIPE

CB

6" SD

SD

(99) (E) 12" STORM DRAIN PIPE

12" SD

(E) WATER VALVE (99)

(E) WATERLINE (99)

6" W

12" W

FFE = 198.547

TEMPORARY BAGGAGE
HANDLING SYSTEM

FIRE RISER CONNECTION POINT
SEE FIRE SPRINKLER PLAN F-102
AND DETAIL 2/F-001

N: 2283538.26
E: 5773871.13

N: 2283538.58
E: 5773916.07

PROPOSED CANOPY

TERMINAL APRON

16" SD

UTILITY ITEMS:

1. INSTALL 6" FIRE MAIN LATERAL PER DETAIL 3/C-501
2. INSTALL THRUST BLOCK PER DETAIL 1/C-501
3. CONNECT TO EXISTING WATER MAIN USING A 6" X 6" TAPPING TEE
4. INSTALL 6" GATE VALVE
5. CONSTRUCT NEW VALVE CAN AND APPURTENANCES ON EX. VALVE PER DETAIL 2/C-501
6. REMOVE CAP AND INSTALL SALVAGED FIRE HYDRANT AND BURY

(99) PROTECT IN PLACE

NOTES:

1. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS, SIZE, AND MATERIAL TYPE PRIOR TO CONSTRUCTION OR ORDERING MATERIALS.
2. CONTRACTOR SHALL MAINTAIN A MINIMUM 12" VERTICAL CLEARANCE BETWEEN WATER AND SEWER LINES.
3. CONTRACTOR SHALL VERIFY PIPE INVERT ELEVATION PRIOR TO INSTALLATION AND NOTIFY THE ENGINEER OF RECORD OF ANY DISCREPANCIES GREATER THAN TWO INCHES.
4. CONTRACTOR SHALL COORDINATE WATER MAIN SHUTOFF WITH ENGINEER OF RECORD AND AIRPORT.
5. FOR FIRE DEPARTMENT CONNECTION REFER TO FIRE SUPPRESSION PLAN DETAIL 2/F-001.
6. FOR ELECTRICAL IMPROVEMENTS, SEE SHEETS E-100 THRU E-152.

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED:

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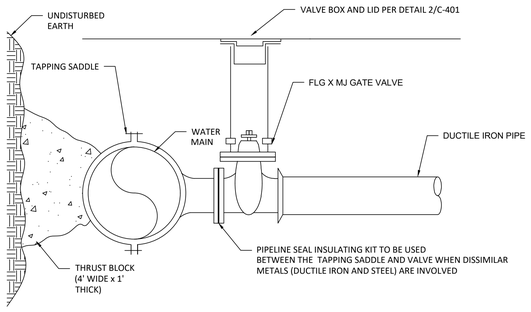
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DATE: January 28, 2026
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SHEET CONTENTS
UTILITY PLAN

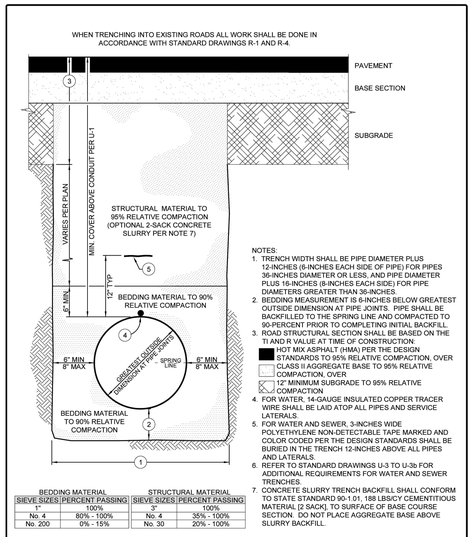
LICENSED PROFESSIONAL ENGINEER
Rafael P. Gonzalez
C 74831
Exp. 12-31-27
Civil Engineer
STATE OF CALIFORNIA

SHEET NO.
C-401

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1/23/2026 8:31:13 AM



7 TAPPING SLEEVE AND VALVE
NOT TO SCALE



BEDDING MATERIAL

SIEVE SIZES	PERCENT PASSING
1"	100%
No. 4	80% - 100%
No. 200	0% - 15%

STRUCTURAL MATERIAL

SIEVE SIZES	PERCENT PASSING
3"	100%
No. 4	35% - 100%
No. 30	20% - 100%

NOTES:
1. TRENCH WIDTH SHALL BE PIPE DIAMETER PLUS 12-INCHES (6-INCHES EACH SIDE OF PIPE) FOR PIPES 36-INCHES DIAMETER OR LESS, AND PIPE DIAMETER PLUS 16-INCHES (8-INCHES EACH SIDE) FOR PIPE DIAMETERS GREATER THAN 36-INCHES.
2. BEDDING MEASUREMENT IS 6-INCHES BELOW GREATEST OUTSIDE DIMENSION AT PIPE JOINTS. PIPE SHALL BE BACKFILLED TO THE SPRING LINE AND COMPACTED TO 90-PERCENT PRIOR TO COMPLETING INITIAL BACKFILL.
3. ROAD STRUCTURAL SECTION SHALL BE BASED ON THE TI AND R VALUE AT TIME OF CONSTRUCTION.
   - HOT MIX ASPHALT (HMA) PER THE DESIGN STANDARDS TO 95% RELATIVE COMPACTION, OVER CLASS II AGGREGATE BASE TO 95% RELATIVE COMPACTION, OVER
   - 12" MINIMUM SUBGRADE TO 95% RELATIVE COMPACTION
4. FOR WATER, 14-GAUGE INSULATED COPPER TRACER WIRE SHALL BE LAID ATOP ALL PIPES AND SERVICE LATERALS.
5. FOR WATER AND SEWER, 3-INCHES WIDE POLYETHYLENE NON-DETECTABLE TAPE MARKED AND COLOR CODED PER THE DESIGN STANDARDS SHALL BE BURIED IN THE TRENCH 12-INCHES ABOVE ALL PIPES AND LATERALS.
6. REFER TO STANDARD DRAWINGS U-3 TO U-3b FOR ADDITIONAL REQUIREMENTS FOR WATER AND SEWER TRENCHES.
7. CONCRETE SLURRY TRENCH BACKFILL SHALL CONFORM TO STATE STANDARD 90-1.01, 188 LBS/CY CEMENTITIOUS MATERIAL [2 SACK], TO SURFACE OF BASE COURSE SECTION. DO NOT PLACE AGGREGATE BASE ABOVE SLURRY BACKFILL.

DEPARTMENT OF PUBLIC WORKS - STANDARD DRAWINGS
TRENCH SECTION
HMA PAVED SURFACE

Issued:	Scale:
August 2022	NTS
Revised:	Revision No:
Drawing No:	U-4

4 TRENCH SECTION - HMA PAVED SURFACE
NOT TO SCALE

TABLE 1

Pipe Dia (in)	Pipe Class	Nom. I.D. (in)	Area (A) (sq in)	THRUST (T) AT FITTING, lbs TEES	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4"	PVC Class 165 (DR 25)	4.39	15	3,254	4,602	2,491	1,270	638
4"	PVC Class 235 (DR 18)	4.23	14	4,005	5,664	3,065	1,563	785
4"	PVC Class 305 (DR 14)	4.07	13	4,619	6,532	3,535	1,802	905
6"	PVC Class 165 (DR 25)	6.31	31	6,723	9,508	5,146	2,623	1,318
6"	PVC Class 235 (DR 18)	6.09	29	8,302	11,740	6,354	3,239	1,627
6"	PVC Class 305 (DR 14)	5.86	27	9,574	13,540	7,328	3,736	1,877
8"	PVC Class 165 (DR 25)	8.28	54	11,577	16,372	8,861	4,517	2,269
8"	PVC Class 235 (DR 18)	7.98	50	14,254	20,158	10,910	5,562	2,794
8"	PVC Class 305 (DR 14)	7.68	46	16,445	23,257	12,587	6,417	3,224
10"	PVC Class 165 (DR 25)	10.16	81	17,431	24,651	13,341	6,801	3,417
10"	PVC Class 235 (DR 18)	9.79	75	21,454	30,340	16,420	8,371	4,206
10"	PVC Class 305 (DR 14)	9.42	70	24,741	34,989	18,936	9,654	4,850
12"	PVC Class 165 (DR 25)	12.08	115	24,641	34,848	18,860	9,615	4,831
12"	PVC Class 235 (DR 18)	11.65	107	30,380	42,964	23,252	11,854	5,956
12"	PVC Class 305 (DR 14)	11.2	99	34,975	49,462	26,768	13,646	6,856
	AWWA PVC C-900 PIPE			BASED ON P = 165 + 50 = 215 psi BASED ON P = 235 + 50 = 285 psi BASED ON P = 305 + 50 = 355 psi				

TABLE 2

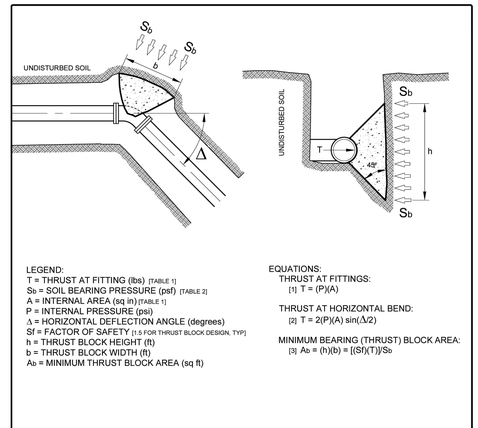
HORIZONTAL BEARING STRENGTHS FOR COMMON SOILS	
SOIL TYPE	HORIZONTAL BEARING STRENGTH (Sb), lbs/sf
MUCK	0
SOFT CLAY	500
SAND	1,000
SAND & GRAVEL	1,500
SAND & GRAVEL CEMENTED WITH CLAY	2,000

NOTES:
1. ALTHOUGH THE ABOVE BEARING STRENGTH VALUES HAVE BEEN USED SUCCESSFULLY IN THE DESIGN OF THRUST BLOCKS AND ARE CONSIDERED TO BE CONSERVATIVE, THEIR ACCURACY IS TOTALLY DEPENDENT ON ACCURATE SOIL IDENTIFICATION AND EVALUATION. THE ULTIMATE RESPONSIBILITY FOR SELECTING THE PROPER BEARING STRENGTH OF A PARTICULAR SOIL TYPE SHALL BE THE RESPONSIBILITY OF THE PROJECT ENGINEER.
2. ALL THRUST BLOCK AREAS SHALL BE PROVIDED ON THE APPROVED PLANS.
3. CONCRETE THRUST BLOCKS SHALL CONFORM TO STATE STANDARD SPECIFICATIONS, 470 LBS/CY CEMENTITIOUS MATERIAL [5 SACK].
4. THRUST RESTRAINT FOR VERTICAL BENDS SHALL USE RESTRAINED JOINT FITTINGS INSTEAD OF THRUST BLOCKS.

DEPARTMENT OF PUBLIC WORKS - STANDARD DRAWINGS
WATERLINE
THRUST BLOCK REQUIREMENTS

Issued:	Scale:
August 2022	NTS
Revised:	Revision No:
Drawing No:	W-1

1 THRUST BLOCK REQUIREMENTS
NOT TO SCALE



LEGEND:
T = THRUST AT FITTING (lbs) [TABLE 1]
Sb = SOIL BEARING PRESSURE (psf) [TABLE 2]
A = INTERNAL AREA (sq in) [TABLE 1]
P = INTERNAL PRESSURE (psi)
Δ = HORIZONTAL DEFLECTION ANGLE (degrees)
Sf = FACTOR OF SAFETY [1.5 FOR THRUST BLOCK DESIGN, TYP]
h = THRUST BLOCK HEIGHT (ft)
b = THRUST BLOCK WIDTH (ft)
Ab = MINIMUM THRUST BLOCK AREA (sq ft)

EQUATIONS:
THRUST AT FITTINGS:
[1] $T = (P)(A)$

THRUST AT HORIZONTAL BEND:
[2] $T = 2(P)(A)\sin(\Delta/2)$

MINIMUM BEARING (THRUST) BLOCK AREA:
[3] $Ab = (h)(b) = [(Sf)(T)]/Sb$

EXAMPLE: DETERMINE THE THRUST BLOCK AREA FOR A 90° BEND, 8" CLASS 165 PIPE IN SAND.

(STEP 1): PRESSURE = 165 + 50 (TEST PRESSURE) = 215 psi. CHOOSE T = 16,372 lbs FROM TABLE 1 SHEET 1/2 (USE EQUATION [2] IF PIPE HAS DIFFERENT INSIDE DIAMETER).

(STEP 2): DETERMINE Sb FROM TABLE 2, SHEET 1/2.

(STEP 3): USE INFORMATION TO CALCULATE Ab USING EQUATION [3]

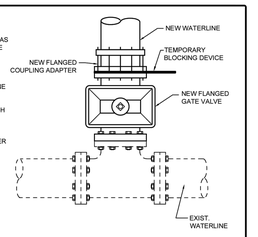
RESULT: Ab = [Sf(T)/Sb = [(1.5)(16,372)]/1,000] = 24.6 sq ft

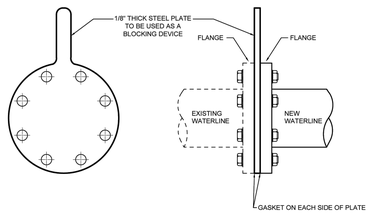
DEPARTMENT OF PUBLIC WORKS - STANDARD DRAWINGS
WATERLINE
THRUST BLOCK REQUIREMENTS

Issued:	Scale:
August 2022	NTS
Revised:	Revision No:
Drawing No:	W-1a

2 THRUST BLOCK REQUIREMENTS
NOT TO SCALE

NOTES:
1. DIRECT CONNECTION TO THE EXISTING WATER SYSTEM SHALL NOT BE PERMITTED UNTIL THE NEW INSTALLATION HAS PASSED BACTERIA TESTING AND A PHYSICAL CHECK BY THE WATER QUALITY MANAGER. SEPARATION SHALL BE ACHIEVED BY THE INSTALLATION OF THE TEMPORARY BLOCKING DEVICE AS SHOWN HEREON.
2. PRESSURE TESTING AGAINST VALVES SHALL NOT BE ALLOWED. NEW VALVES SHALL BE SWABBED WITH CHLORINE PRIOR TO INSTALLATION.
3. WHEN TEMPORARY BLOCKING DEVICE IS REMOVED, THE CONTRACTOR SHALL ADJUST FITTING TO ELIMINATE 1/8-INCH GAP WITHOUT FORCING THE JOINT TOGETHER.
4. TEST PRESSURE SHALL BE 50 PSI GREATER THAN THE WORKING PRESSURE OF THE PIPE MEASURED AT THE LOWEST ELEVATION OF THE SYSTEM OR 150 PSI, WHICHEVER IS GREATER.



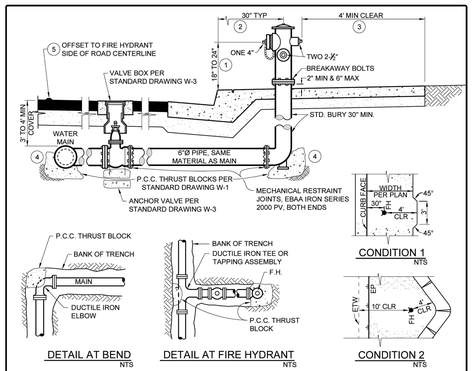


PROCEDURE FOR CONNECTING NEW WATERLINES TO EXISTING SYSTEM (ALTERNATIVE TO THE OLD INDUSTRIAL STANDARD METHOD): AT THE POINT OF CONNECTION TO THE EXISTING SYSTEM, ALL JOINTS BETWEEN FITTINGS AND VALVES SHALL BE FLANGED. ANY CHANGE REQUIRES WRITTEN APPROVAL FROM THE DEPARTMENT. AT THE JOINT THAT CONNECTS THE EXISTING SYSTEM TO THE NEW LINE, A BLOCKING DEVICE SHALL BE INSTALLED. THIS DEVICE SHALL BE CONSTRUCTED OF 1/8-INCH THICK STEEL PLATE. IT SHALL BE INSTALLED BETWEEN THE TWO FLANGES WITH A GASKET ON EACH SIDE. THIS WILL ALLOW ALL FITTINGS, VALVES, AND THE PIPELINE TO BE DISINFECTED AND PRESSURE TESTED AS ONE UNIT. AFTER THE NEW SYSTEM HAS MET ALL REQUIREMENTS, THE DEPARTMENT WILL ALLOW THE CONTRACTOR TO REMOVE THE BLOCKING DEVICE. THE DEVICE AND BOTH GASKETS ARE TO BE REMOVED AND A NEW GASKET SHALL BE INSTALLED BETWEEN THE FLANGES. THE NEW SYSTEM IS THEN IN SERVICE.

DEPARTMENT OF PUBLIC WORKS - STANDARD DRAWINGS
WATERLINE
CONNECTION DETAIL

Issued:	Scale:
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Revised:	Revision No:
Drawing No:	W-8

5 WATERLINE CONNECTION DETAIL
NOT TO SCALE

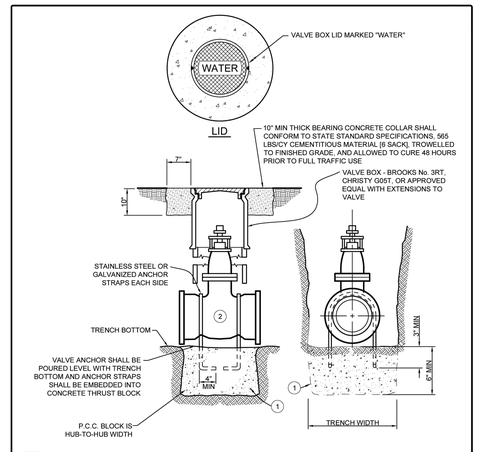


NOTES:
1. HEIGHT SHALL BE MEASURED FROM EDGE OF PAVEMENT WHEN CONCRETE CURB OR ASPHALT DIKE ARE NOT REQUIRED PER THE DESIGN STANDARDS.
2. DISTANCE SHALL BE INCREASED TO 10-FEET CLEAR FROM THE EDGE OF TRAVELED WAY (ETW) ON RURAL ROADS (SEE U-1).
3. IN RURAL AREAS A 4-FEET MINIMUM RADIUS CLEAR AND LEVEL ZONE SURROUNDING THE FIRE HYDRANT SHALL BE REQUIRED.
4. CONCRETE THRUST BLOCKS SHALL CONFORM TO STATE STANDARD SPECIFICATIONS, 470 LBS/CY CEMENTITIOUS MATERIAL [5 SACK], POURED AGAINST UNDISTURBED SOIL AND SHIELDED FROM FLANGES AND BOLTS.
5. EACH HYDRANT SHALL BE IDENTIFIED BY A REFLECTORIZED BLUE RAISED PAVEMENT MARKER PER SECTION 10.301c OF THE UNIFORM FIRE CODE.
6. THE HYDRANT CAP AND OUTLET NOZZLE SHALL BE PAINTED IN ACCORDANCE WITH SECTION 6.2.1.D.2.
7. THE CONCRETE CURB OR ASPHALT DIKE SHALL BE PAINTED RED 15-FEET EITHER SIDE OF THE FIRE HYDRANT.
8. HYDRANT SHALL BE CLOW F960, OR APPROVED EQUAL.
9. EACH HYDRANT SHALL HAVE TWO 2-1/2" OUTLETS AND ONE 4" OUTLET WITH EXTERNAL NSF THREAD.
10. ALL FITTINGS SHALL BE CEMENT MORTAR LINED IN ACCORDANCE WITH AWWA STANDARD C-104.
11. HYDRANT LATERAL SHALL BE OF THE SAME MATERIAL AS THE MAIN.
12. 14-GAUGE INSULATED COPPER TRACER WIRE SHALL BE LAID IN THE TRENCH ABOVE THE PIPE, BROUGHT ABOVE GRADE AND SECURED TO THE HYDRANT BOLT FLANGE.
13. COLOR CODED BLUE 3-INCH WIDE POLYETHYLENE NON-DETECTABLE TAPE MARKED "CAUTION BURIED WATER LINE BELOW" SHALL BE BURIED IN THE TRENCH AND ABOVE THE PIPE AND TRACER WIRE.

DEPARTMENT OF PUBLIC WORKS - STANDARD DRAWINGS
WATERLINE
FIRE HYDRANT INSTALLATION

Issued:	Scale:
August 2022	NTS
Revised:	Revision No:
Drawing No:	W-2

3 FIRE MAIN LATERAL INSTALLATION
NOT TO SCALE



NOTES:
1. CONCRETE THRUST BLOCKS SHALL CONFORM TO STATE STANDARD SPECIFICATIONS, 470 LBS/CY CEMENTITIOUS MATERIAL [5 SACK], AND POURED AGAINST UNDISTURBED NATIVE SOIL.
2. VALVES SHALL OPEN TO THE LEFT, HAVE NON-RISING STEM WITH O-RING SEALS, RESILIENT WEDGE, RESILIENT SEAT WITH FULLY ENCAPSULATED GATE, EPOXY COATED INSIDE AND OUTSIDE, FULL SIZE WATERWAY, 200 PSI WORKING PRESSURE, AND MEET AWWA C-509. VALVES SHALL HAVE TYPE 316 STAINLESS STEEL BOLTS AND NUTS FOR THE STUFFING BOX AND BONNET, AND SHALL BE CLOW 2639/2640, MUELLER A-2361 RESILIENT WEDGE GATE VALVES THIN WALL, OR APPROVED EQUAL.
3. ALL MATERIALS AND INSTALLATION SHALL CONFORM WITH THE APPLICABLE SECTIONS OF THE DESIGN STANDARDS.
4. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE SHEET AND ALL FLANGES AND BOLTS SHALL BE SHIELDED FROM CONCRETE PER THE DESIGN STANDARDS.
5. UNDER NO CIRCUMSTANCES SHALL UTILITY LIDS AND CONCRETE COLLARS BE LOCATED WITHIN CURBS, GUTTERS, SIDEWALKS, DRIVEWAY APRONS, CURB RAMPS, OR CROSS GUTTERS.

DEPARTMENT OF PUBLIC WORKS - STANDARD DRAWINGS
WATERLINE
VALVE ANCHOR & BOX

Issued:	Scale:
August 2022	NTS
Revised:	Revision No:
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2 VALVE ANCHOR & BOX
NOT TO SCALE

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Ontario, CA 91761
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SBP

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT
1 09/29/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: CJM
DRAWN BY: CJM
CHECKED BY: RPG
DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY DETAILS

SHEET NO:
C-501

LICENSED PROFESSIONAL ENGINEER
Rafael P. Gonzalez
C 74831
Exp. 12-31-27
Civil Engineer
STATE OF CALIFORNIA

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STRUCTURAL NOTES

GENERAL NOTES

1. The following notes, typical details and schedules shall apply to all phases of this project unless otherwise shown or noted.
2. Specific notes and details shall take precedence over general notes and typical details.
3. All materials and workmanship shall conform to the minimum standards of the 2022 edition of the California Building Code (CBC) and such other regulating agencies exercising authority over any portion of the work. The contractor shall have a current copy of the CBC (print or digital version) on the job site.
4. The Construction Documents shall consist of these notes, details, schedules, plans, drawings, and Specifications.
5. All specifications, including but not limited to materials and products, shall be those put forth in the Construction Documents. No substitutions shall be permitted to be used or assumed to be used in the bidding or construction process without written approval by the Engineer of Record.
6. The contractor shall examine the Construction Documents and shall notify the Engineer of Record of any discrepancies they may find before proceeding with the work.
7. All information on existing conditions shown on drawings are based on best present knowledge available, but without guarantee of accuracy. The Contractor shall verify and be responsible for all dimensions and conditions at the site and shall notify the Engineer of Record of any discrepancies between actual site conditions and information shown on or in the Construction Documents before proceeding with work.
8. The Contractor shall immediately notify the Engineer of Record of any condition which in their opinion might endanger the stability of the structure or cause distress of the structure.
9. The Contractor shall provide temporary bracing and shoring for all structural members as required for structural stability of the structure during all phases of construction.
10. All work shall conform to the best practice prevailing in the various trades comprising work. The Contractor shall be responsible for coordinating the work of all trades.
11. These Construction Documents represent the finished structure, and do not indicate the method of construction. The Contractor shall supervise and direct the work and shall be solely responsible for construction means, methods, techniques, sequences and procedures.
12. The Contractor shall take all steps necessary to ensure proper alignment of the structure after the installation of all structural and finish materials. This shall include any necessary preloading of the structure to determine final position of the completed work.
13. These notes, details, drawings and Specifications (Construction Documents) do not carry necessary provisions for construction safety. These documents and all phases of construction are to be governed, at all times, by applicable provisions of the current California Occupational Safety and Health Act.
14. Where any conflict occurs between the requirements of federal, state and local laws, codes, ordinances, rules and regulations, the most stringent shall govern.
15. Inspection and approval for shops used for fabrication of structural load bearing members, components, materials or assemblies shall conform to CBC Section 1704.2.5.
    A. Labeling (as required or specified) shall be provided in accordance with CBC Section 1703.5.
    B. Evaluation and follow-up inspection services (as required or specified), shall conform to CBC Section 1703.6.
16. The Contractor shall refer to the Specifications for information not covered by these drawings and General Notes.
17. Observation visits to the project site by field representatives of the Engineer of Record (support services) shall not include inspections of safety or protective measures, nor construction procedures, techniques or methods. Any support services performed by Engineer of Record during any phase of construction, shall be distinguished from continuous and detailed inspection services (as required by any regulating governmental agency, e.g. the Authority Having Jurisdiction) provided by others. These support services, whether of material or work, are performed solely for the purpose of assisting in quality control and in achieving conformance with contract documents, but do not guarantee Contractor's performance and shall not be construed as supervision of construction.
18. Provide openings and supports as required per typical details and notes for mechanical, plumbing, and electrical equipment, vents, ducts, piping, etc. All mechanical, plumbing and electrical equipment shall be properly braced against lateral forces.
19. Refer to drawings by other disciplines to coordinate with Structural Drawings. Any discrepancy between these drawings shall be referred to the Architect or Engineer of Record for clarification prior to the start of construction.
20. Written dimensions shall have precedence over scaled dimensions.
21. Drawings (notes, schedules, details and plans) shall have precedence over Structural Calculations.
22. In the event that certain features of the construction are not fully shown on the drawings or called for in the General Notes or Specifications, their construction shall be of the same character as for similar conditions that are shown or called for.
23. The Contractor shall have a copy of the Project Geotechnical Investigation on the job site.
24. ASTM designation and all standards refer to the latest amendments.
25. These structural Construction Documents shall not be modified without prior written approval of the Engineer of Record.
26. Only structural working drawings approved by the Authority Having Jurisdiction are permitted to be used for construction on this project. All other drawings or documents are obsolete and are not permitted on the job site, nor shall they be used for any construction purposes. Contractors using unapproved drawings or documents are solely responsible for all work not performed in accordance with the "approved" drawings.
27. Refer to Architectural Drawings for all fire protection requirements.

SHOP DRAWING AND CONTRACTOR SUBMITTAL REVIEW

1. Shop Drawings or Contractor Submittals should be provided for the fabrication (or proportioning) of the following (but not limited to) components or elements.
    A. Concrete mix designs
    B. Sprung Structure
    C. Reinforcing bar
    D. Structural Steel
    E. Substitute or alternate materials
    F. Fire sprinklers
    G. Formwork and shoring
2. The Contractor shall be responsible for the production of Shop Drawings or Contractor Submittals, the distribution of documents to the Engineer of Record for review, incorporation of any noted revisions made by the Engineer of Record into the documents, and final approval.
3. Shop drawings shall not be a reproduction of structural drawing sheets.
4. When the Contractor submits shop drawings or other submittals to the Engineer of Record for review, submittal package shall contain sufficient copies that the Engineer of Record may retain a complete copy of submittal package.
5. The Contractor shall allow sufficient time for the Engineer of Record to thoroughly review submittal package (10 working days, minimum).
6. Review of Shop Drawings or Contractor Submittal by Engineer of Record does not in any way constitute approval of submittal package. Engineer of Record's review is for general conformance with the design concept and contract documents. Review shall not be construed as relieving the Contractor from compliance with the contract documents.

DEMOLITION

1. Safety Note:
    A. It is solely the Contractor's responsibility to comply with the pertinent sections of the Construction Safety Orders issued by the State of California, latest edition, and all OSHA Requirements.
    B. The Engineer of Record does not accept any responsibility for the Contractor's failure to comply with these requirements.
    C. The Contractor shall be responsible for adequate design and construction of all forms. Forms shall be adequately braced and shored.
2. Shore beams where necessary to maintain the structural integrity of the existing structure.
3. The Contractor is responsible for the design and location of all shoring.
4. Notify the Engineer of Record of any discrepancies between the plans and existing structure.
5. When saw cutting concrete or masonry, care shall be taken not to overcut or damage reinforcing bars.

FOUNDATION

1. Unexpected soil conditions: Allowable values and foundation design are based upon soil conditions shown by test borings as presented in the project Geotechnical Investigation. Actual soil conditions which deviate from that shown in the test borings shall be reported to the Project Geotechnical Engineer immediately.
2. See project Geotechnical Investigation for compaction, fill, backfilling, and site preparation requirements and procedures.
3. Excavate all foundations to required depths into compacted fill or natural soil.
    A. All foundation excavations shall be inspected and approved by the project Geotechnical Engineer, prior to forming and placement of reinforcing and/or concrete.
    B. Foundation excavations shall be cut square and smooth with firm level bottoms.
    C. Care shall be taken not to over-excavate foundations at lower elevations and prevent disturbing soils around higher elevations.
4. Footings shall be poured in neat excavations, without side forms whenever possible.
5. Moisten sides and bottom of excavations several times prior to concrete placement.
6. Foundations shall not be poured until all required reinforcing bar, sleeves, inserts, conduits, pipes, formwork, etc. are properly placed and inspected by the Authority Having Jurisdiction.
7. De-water footing excavations and foundation block-outs to maintain dry working conditions.

HELICAL PIERS

1. General (Reference ICC-ES ESR-2794)
    A. The Chance helical pier foundation system shall be installed by authorized Chance dealers. These dealers shall have satisfied the certification requirements relating to the technical aspects of the product and the ascribed installation techniques.
    B. All work as described herein shall be performed in accordance with all applicable safety codes in effect at the time of installation.
    C. The dealer shall employ a skilled, experienced work force who are familiar with the requirements and methods necessary for proper performance of the work as outlined in these specifications.
2. Helical Pier Location: Helical piers should be installed as shown in the Structural Drawings.
3. Helical Pier Selection
    A. The lead sections with helices and extension sections shall be manufactured by Chance and as shown on attached drawings.
    B. All units shall conform to the material specifications as referenced on these drawings.
    C. The number and sizes of helices, the helical pier embedment depth, and the shaft size of helical pier shall be verified by a single test pier at the site, prior to installation for the entire project.
    D. The data acquired, along with other information available about the site, shall be used in determining the proper helical pier. The dealer shall have the option of performing a soil test using either the Chance soil probe or other method approved by the Engineer of Record.
4. Installation Equipment: Installing Units
    A. Installation units shall consist of rotary type torque motors with forward and reverse capabilities. These units shall be either electrically or hydraulically powered.
    B. These units shall be capable of developing the minimum torque as required by the plan of repair.
    C. These units shall be capable of positioning the helical pier at the proper installation angle. This angle varies between zero (0) (vertical) to 10 degrees depending upon application and type of foundation termination specified.
    D. These units shall be in good working condition and capable of being operated in a safe manner.
5. Installation Equipment: Installation Tooling
    A. Adapters approved by the Engineer of Record shall be employed to safely connect the installation units to the helical piers and extensions.
    B. These adapters shall have torque capacity ratings at least equal to the minimum ultimate torque rating of the helical piers as specified for the project.
    C. These adapters shall be securely connected to the helical pier during installation so as to prevent accidental separation.
6. Installation Equipment: Torque monitoring devices
    A. The torque being applied by the installing units shall be monitored throughout the installation process.
    B. Torque monitoring devices shall be either a part of the installing unit or an independent device in-line with the installing unit calibration data for either unit shall be available for review by the owner or owner's representative.
7. Installation Procedures
    A. The helical pier shall be positioned as shown in the Structural Drawings. Proper angular alignment shall be established at the start of installation.
    B. The helical pier shall be installed in a smooth, continuous manner. The rate of helical pier rotation shall be in the range of 5 to 20 revolutions per minute.
    C. Sufficient down pressure shall be applied to advance the helical pier.
    D. Plain extension material may be required to position the helical pier at the depth required. Extensions shall be coupled to the helical pier using the bolts provided with the extension. These bolts shall be installed and tightened to approximately 40 ft.-lb. of torque.
    E. Installation torque shall be monitored throughout the installation process.
    F. If underground obstructions are encountered during installation, the dealer shall have the option of removing the obstruction if possible or relocating the helical pier. This latter option may require the relocation of adjacent helical piers, as directed by the Engineer of Record.
8. Termination of Installation
    A. The maximum installation torque shall at no time exceed the torque rating of the helical pier shaft as specified for the project.
    B. Helical piers shall be installed to the minimum torque value as shown in the Structural Drawings. If the minimum torque requirement has not been satisfied at the minimum depth level, the dealer shall have the following options. Approval from the Engineer of Record shall be obtained before option (2) or (3) is implemented.
        (1) Install the helical pier deeper using additional plain extension material until the specified torque level is obtained, or
        (2) Remove the existing helical pier and install a helical pier with larger and/or more helices. This revised helical pier shall be installed at least three (3) feet beyond the termination depth of the original helical pier.
        (3) Add additional helical piers.
    C. If the installer cannot achieve the minimum depth outlined in the Structural Drawings, the Engineer of Record shall be contacted before proceeding further. If the maximum torque rating of the installing unit has been reached but that of the helical pier has not prior to satisfying the minimum depth requirement, the dealer shall have the option of utilizing a higher torque installing unit to drive the helical pier deeper.
    D. If the minimum torque rating of the helical pier and/or installing unit has been reached prior to satisfying the minimum depth level, the dealer shall have the following options. Approval from the Engineer of Record shall be obtained before either option (1) or (2) is implemented.
        (1) Terminate the installation at the depth obtained, or
        (2) Remove the existing helical pier and install a helical pier with smaller and/or fewer helices. This revised helical pier shall be installed at least three (3) feet beyond the termination depth of the original helical pier.
9. Connection Bracket/Haunch: The helical pier shall be connected to the structure using a chance approved steel bracket or properly designed steel-reinforced concrete haunch capable of safely transferring the structural loads to the helical pier.
10. Written installation records shall be maintained for each helical pier. These records shall include, but are not limited to the following:
    A. Project name and location
    B. Name of authorized chance dealer
    C. Name of dealer's foreman or representative who witnessed the installation
    D. Date and time of installation
    E. Location and reference number of helical pier
    F. Descriptions of lead section and extensions installed
    G. Overall depth of installation as referenced from bottom of grade beam or footing
    H. Torque readings for the last three (3) feet of installation if practical. In lieu of this requirement, the termination torque shall be recorded as a minimum.
    I. Any other applicable information relating to the installation
11. SSS Specifications:
    A. Helix bearing plate: (helix bearing plates are formed on matching metal dies to form a true helix) hot rolled carbon steel sheet, strip, or plate per ASTM A572, or A1018, or A656 with minimum yield strength of 50 ksi, plate thickness is ⅜"
    B. Helical pier shaft: Hot rolled round-cornered-square (RCS) 1½" solid steel shafts conforming to the general requirements of ASTM A29. Medium carbon steel grade with improved strength due to fine grain size.
        (1) Installation torque rating: 5,500 ft.-lbs.
        (2) Minimum ultimate tension strength: 70 kips (criteria - coupling bolt)
        (3) Minimum ultimate tension strength: 55 kips (criteria - torque)
    C. Coupling bolts: ⅝" diameter bolt per ASTM A320 grade l7. F_y (min) = 105 ksi, F_u (min) =125 ksi.
    D. Extension section couplings: Shall be formed as integral part of the plain extension shaft material. For SS anchors, couplings shall be hot upset forged sockets formed as integral part of the plain extension shaft material. For 278 material, couplings shall be hot upset expanded sockets.
    E. Foundation repair bracket: Brackets are formed from steel that meets or exceeds the requirements of ASTM A36, and have a hot-dipped galvanized coating per ASTM A153.
    F. Welding:
        (1) All welding shall be in accordance with AWS D1.1, latest revision
        (2) All welders shall be chance certified to AWS Specifications.
    G. Finish, galvanized: All material shall be hot-dipped galvanized in accordance with ASTM A153 after fabrication.

REINFORCING BAR

1. All reinforcing bar shall be deformed intermediate grade bars conforming to ASTM A615, Grade 60 (f_y = 60 ksi), unless noted otherwise.
    A. Grade 40 (f_y = 40 ksi) may be used for #3 bars and smaller.
2. Reinforcing bar shall not be welded, unless noted or detailed otherwise.
3. To hold reinforcing bars in their true position and prevent displacement, standard tie and anchorage devices shall be provided. Placing of reinforcement shall conform to ACI 318-14 Section 26.6.2.
4. Shop drawings for fabrication of any reinforcing bar shall be provided by the Contractor and submitted to the Engineer of Record for their review and approval, prior to fabrication.
5. Refer to typical details for minimum splice length and minimum radius of bend for reinforcing bar.
6. All reinforcing bar splices shall be staggered 24", unless noted or detailed otherwise.
7. All reinforcing bar bends shall be made cold.
8. Fabrication, erection and placement of reinforcing bar shall conform to Concrete Reinforcing Steel Institute Manual of Standard Practice.
9. Reinforcing bar shall be clean of rust, grease or other material likely to impair bond.
10. Welded wire mesh shall conform to ASTM A185. Lap all wire mesh two modules, minimum.
11. Welding of reinforcing bar (where specifically noted or detailed) shall conform to ACI 318-14, Section 26.6.4 and AWS D1.4. Welded rebar shall be low-alloy steel conforming to ASTM A706.
12. Epoxy-coated reinforcement (where specifically noted or detailed) shall conform to ASTM A775.

CONCRETE

1. All concrete work shall comply with CBC Chapter 19 and ACI 318-19 and latest edition of ACI Manual of Concrete Practice.
2. Special Inspection (as required or specified) shall conform to CBC Chapter 17.
3. All structural concrete shall be regular weight.
4. Concrete shall be well graded and meet the following minimum requirements:

Concrete Use	Comp. Strength (f'c)	Exposure Classes per ACI 318 19.3.1	Max. w/c Ratio	Nominal Max. Aggregate Size
Grade Beams & Pile Caps	4,000 psi at 28 Days	F0, S1, W0, C1	0.50	1"
Slab on Grade	4,000psi at 28 Days	F0, S1, W0, C1	0.45	1½"

5. Cement shall be Portland Cement of either type below;
    A. Type II/V, conforming to ASTM C150
    B. Type I with (HS) designation, conforming to ASTM C595
6. Fly ash, if used, shall conform to ASTM C618.
7. Slag cement, if used, shall conform to ASTM C989
8. Fly ash and slag cement shall not be used in combination. Fly ash or slag cement content shall be between 15% and 40%, by weight, of total cementitious materials and shall conform to ASTM C618.
9. Aggregates shall conform to ASTM C33; provide aggregates from a single source.
10. Water shall conform to ASTM C94 and be potable.
11. All splices are to be Class B unless specifically noted otherwise.
12. Minimum concrete cover over reinforcing bar shall be:

Concrete cast against and permanently exposed to earth or weather	3"
Concrete placed against forms, but exposed to earth or weather	2"
Slabs, wall & joists, not exposed to earth or weather	¾"
Beams, girders & columns, not exposed to earth or weather	1½"

13. Location of all construction joints, other than specified, shall be approved by Architect/Engineer of Record prior to pouring. Construction joints shall be thoroughly air and water cleaned and heavily roughened so as to expose coarse aggregates. All surfaces to receive concrete shall be maintained continuously wet at least three hours in advance of pouring.
14. All reinforcing steel, anchor bolts, dowels, inserts and any other hardware to be set in concrete shall be well secured in position prior to pouring of concrete.
15. The Contractor shall obtain approval from Architect/Engineer of Record prior to placing sleeves, pipes, ducts, chases, coring and openings on or through structural concrete beams, walls, floors and roof slabs, unless specifically detailed or noted. All pipes or conduits passing through concrete members shall be sleeved with standard steel pipes. See typical detail for pipe through footing.
16. Vibrate all concrete (including slabs on grade) as it is placed, with a mechanical vibrator operated by experienced personnel. The vibrator shall be used to consolidate the concrete, not transport it. Reinforcing and forms shall not be vibrated.
17. Formwork design and removal shall conform to ACI 318-14 Section 26.11. Remove forms in accordance with the following minimum schedule:

Side forms of footings	Minimum 48 hours
Edge forms of slab on grade	Minimum 24 hours
Wall/Retaining Wall forms	72 hours & 70% of design strength
Column forms	72 hours & 70% of design strength
Elevated beams and slabs	14 days & 80% of design strength

18. Concrete shall not free fall more than six feet. Use tremie, pump or other approved methods.
19. Concrete shall be maintained in a moist condition for a minimum of 5 days after placement or concrete surfaces shall be cured with liquid membrane-forming curing compound conforming to ASTM C309, Type 1, Class A. Curing compound shall be approved by the Engineer of Record.
20. The Contractor may use concrete admixtures as a construction means and methods to execute Construction Documents. Use of admixture is solely the responsibility of the Contractor.
21. Concrete mix designs shall be prepared by the concrete supply plant. Each mix design shall be submitted with current supporting data to the Engineer of Record for review and approval. Each mix design shall be stamped and signed by a Civil or Structural Engineer licensed in the state of the project jurisdiction.
22. Only one grade of concrete shall be allowed on project site at any one time.
23. Unless noted otherwise, construction and control joints shall be provided in all concrete slabs on grade, and shall be located such that the area within joints does not exceed 375 sq. ft., and is roughly square.
    A. For all structural slabs (suspended or on grade) where Architecturally exposed conditions are desired, the Contractor shall provide control joint layout for review by Architect and Engineer of Record.
24. Every opening exceeding 24" (in either direction) shall have a minimum of 2-#5 (U.N.O.) directly adjacent to all sides as well as top and bottom (unless at foundation). Reinforcing bars shall extend a minimum of 24" past edge of opening.
25. Dowel all concrete walls and columns to supporting concrete with bars of the same size and spacing as vertical bars in wall and columns. Do not "hickey" bars. All dowels shall be vertical.
26. Provide a minimum of 2-#5 continuous horizontally at tops of walls and vertically at ends of walls, unless noted otherwise.
27. Concrete strength shall be verified by standard cylinder tests (in accordance with CBC Section 1705.3) made by a testing laboratory approved by the Authority Having Jurisdiction.
28. Concrete placed when the air temperature has fallen to, or is expected to fall below 40° shall conform to ACI 318-14 Section 26.54 and ACI 306R-16.
29. Concrete placed during hot weather shall conform to ACI 318-14 Section 26.5.5 and ACI 305R-14.
30. Aluminum material shall not be place in concrete.
31. Conduits and sleeves placed within structural concrete shall not be tied directly to structural reinforcement.
    A. 1" clear distance shall be maintained between conduits/sleeves and reinforcing bar.

STRUCTURAL STEEL AND WELDING

1. All structural steel construction shall conform to AISC 360-16 and AISC 341-16.
    A. All structural steel shall be fabricated in an approved fabrication shop. Inspection and approval of fabrication shops shall conform to CBC Section 1704.2.5.
2. All structural steel shall conform to the following specifications:

Steel Shape	ASTM Specificaiton	Min. Yield Stress, F_y (ksi)
Angle, Channel	A36	36
Plates, Bars, Rounds	A36	36
Wide Flange, WT	A992	50
Pipe	A53, Grade B	35
HSS Tube	A500, Grade C	50
HSS Round	A500, Grade B	42

3. Special Inspection shall be provided for all structural steel and welding, in accordance with CBC Chapter 17.
4. All structural steel shall be fabricated, erected and welded in accordance with AISC Specifications for Structural Steel Buildings (AISC 360-16) and Code of Standard Practice for Steel Buildings and Bridges (AISC 303-16).
5. All welding shall be performed by welders with current AWS certification for weld procedures used.
6. No field welding permitted, unless specifically noted otherwise.
7. Shop drawings for the fabrication of structural steel shall be submitted to Engineer of Record for their review, prior to fabrication.
8. No holes other than those specifically detailed shall be allowed through structural steel members. Burning of holes is not permitted.
9. All structural steel shall be painted one shop coat and field touched-up, as necessary, with approved "Zinc Rich" or other high quality exterior primer.
10. All structural and architectural steel exposed to weather shall be corrroion protected by being hot dipped galvanized and/or suitably primed and painted as shown on the architectural drawings and per the project specifications. Steel elements embedded in concrete shall be left unpainted.
11. See architectural drawings for locations of all Architecturally Exposed Structural Steel (AESS). Fabrication, welding, and erection of AESS shall comply with the latest edition of AISC code of standard practice for steel buildings and bridges.
12. All welding shall conform to AWS D1.1 and D1.8 specifications for welding. (E-70XX Electrodes).
13. All headed studs (for concrete anchorage) shall be manufactured by Nelson or approved equal per ASTM A108.
14. Non-shrink grout shall meet the requirements of ASTM Standard C1107, and shall attain a minimum 28 day compressive strength of 8000 psi.
15. Bolted Steel Connection Requirements
    A. High Strength Bolts (HSB) shall conform to ASTM A325/F1852 and ASTM A490 where specified. See details and schedules for bolt diameters and bolt types.
    Bolt tensioning requirement shall be as follows, U.N.O.:
        a. Bolts to beam web at non-moment connections -Snug tight for bearing connection
        b. Bolts to beam at moment connections -Slip critical (TYPE SC) U.N.O.
        c. All other bolted connections -Slip critical (TYPE SC) U.N.O.
    B. Machine bolts shall conform to ASTM A307, GRADE A.
    C. All bolt holes shall be standard size holes ($\frac{1}{16}$" larger than bolt), U.N.O.
    D. All bolts specified as slip critical bolts (A325-SC or A490-SC) shall have class 'A' faying surfaces (U.N.O.)
    E. Anchor bolts for non-frame columns shall be ASTM F1554, GRADE 36 (S1 & S4). Anchor bolts for all columns embedded into concrete walls shall be ASTM F1554, GRADE 55 (S4). Anchor bolts for ledgers to concrete or CMU wall shall be ASTM A307 or A36
16. Where fillet weld size is not indicated, use AWS minimum size, as specified in AISC Specifications for Structural Steel Buildings (AISC 360-16), Section J2.2.
17. All butt welds to be complete joint penetration, unless noted otherwise.
18. Welder qualification requirements, welding procedure and welding electrodes for all structural steel (except structural sheet steel as outlined in the steel deck section) shall conform to CBC Sections 1705.2 and 2204.1.
19. Provide hot dip galvanizing or 3" minimum concrete cover around all structural steel below grade.
20. Structural steel embedded into concrete or masonry shall be unpainted.
21. All steel members related to elevators shall be coordinated with the elevator contractor prior to fabrication.

STRUCTURAL DESIGN VALUES

All values reported are unfactored and strength level, unless noted otherwise

Gravity Design Data	Value
Dead Loads - Sprung Building:	
Roof Dead Load	SEE MFR.
Floor Dead Load	75 psf
Equipment Load	SEE PLAN
Exterior Wall Dead Load	SEE MR.
Dead Loads - Canopy:	
Roof Dead Load	10 psf
Live Loads - Sprung Building:	
Roof Live Load (Per Manufacturer)	0 psf
Floor Live Load	100 psf
Live Loads - Canopy:	
Roof Live Load (Reducible)	20 psf
Snow Loads:	
Ground Snow Load, P_g	0 psf
Rain Loads:	
Rain Load, R	0 psf
15 min./100 yr. Rainfall Intensity	2.54 in/hr
60 min./100 yr. Rainfall Intensity	1.26 in/hr
Deflection Criteria:	
Roof, Total Load	L/240
Roof, Live Load	L/360
Floor, Total Load	L/240
Floor, Live Load	L/360

Wind Design Data	Value
Design Wind Speed (3-sec gust), V_{ULT}	99 mph
Risk Category	II
Exposure Category	C
Applicable Internal Pressure Coefficient	± 0.18

Earthquake Design Data	Value
Risk Category	II
Importance Factor, I_e	1.25
Mapped Spectral Response Accelerations	S_S= 1.076 g S_1= 0.396 g
Site Class	C
Spectral Response Coefficients	S_{MS}= 0.861 g S_{M1}= 0.396 g
Seismic Design Category	D
Analysis Procedure Used	Equivalent Lateral Force Procedure (ASCE 7, 12.8)
Basic Seismic-Force Resisting System - Canopy	Cantilever column systems: Steel Ordinary Cantilever Column

Geotechnical Design Data	Value
Geotechnical Report prepared by: Earth Systems Pacific (File No.: 304536-001)	Dated: 2/27/2024
Mat Foundation Allowable Soil Bearing Pressure (DL + LL)	1500 psf
Mat Modulus of Subgrade Reaction	50 pci
Design Active Pressure, P_a	- pcf
Design At-Rest Pressure, P_b	- pcf
Design Passive Pressure, P_p	350 pcf
Design Coefficient of Friction, f_r	0.35

STRUCTURAL OBSERVATION

1. Structural Observation is the visual observation of the structural system by a Registered Design Professional for general conformance to the approved construction documents at significant construction stages and at completion of the structural system. Structural Observation does not include or waive the responsibility for the inspection required by Section 110, 1704 or other Sections of the California Building Code.
2. All Structural Observation shall be provided in accordance with CBC Sections 1702 and 1704.6.
3. The owner shall employ the Engineer of Record to perform Structural Observation in accordance with CBC Section 1704.6. The Engineer of Record may designate another Engineer or Architect to perform Structural Observation.
4. The contractor shall notify this office 48-72 hours in advance of requesting a Structural Observation.
5. Structural Observation is required at significant construction stages and at completion of the structural system, as follows:
    A. Footing excavations completed, footing reinforcing bars in-place, embedded items in place, mechanical, plumbing and electrical items in place and prior to concrete placement.
    B. Slab on grade reinforcing bars in place and embedded items in place, prior to concrete placement.
    C. All structural work completed including the installation of mechanical, plumbing, and electrical items.
6. The Structural Observer shall submit to the Authority Having Jurisdiction a written statement that the site visits have been made and identifying any structural deficiencies that, to the best of their knowledge, have not been resolved.

ABBREVIATIONS

A.B.	Anchor Bolt	IBC	International Building Code
ABV.	Above	ICC	International Code Council
ACI	American Concrete Institute	ICF	Insulated Concrete Form
ADD'L	Additional	ID	Inside Diameter
ADJ.	Adjacent	IN.	Inch, Inches
AHJ	Authority Having Jurisdiction	INT.	Interior
AISC	American Institute of Steel Construction	JST.	Joist
AITC	American Institute of Timber Construction	ksi	Kips per Square Inch
AOR	Architect of Record		
APA	American Plywood Association	LL	Live Load
APPROX.	Approximate(ly)	LW	Lightweight
ASCE	American Society of Civil Engineers	LSL	Laminated Strand Lumber
		LVL	Laminated Veneer Lumber
ARCH.	Architect, Architecture		
ASTM	American Society of Testing and Materials	MAX.	Maximum
		MB	Machine Bolt
ATR	All Thread Rod	MBM	Metal Building Manufacturer
AWS	American Welding Society	MECH.	Mechanical
		MSE	Mechanically Stabilized Earth
BLDG.	Building	MFR.	Manufactured, Manufacturer
BLK.	Block	MIN.	Minimum
BLKD.	Blocked	MPH	Miles per Hour
BLK'G	Blocking	MTL.	Metal
BM.	Beam		
B.O.	Bottom of _____	(N)	New
BOT.	Bottom	NDS	National Design Specification
BRG.	Bearing	N.T.S.	Not to Scale
b/t	Between		
		o.c.	On Center
CAC	California Administrative Code	o/	Over
CANT.	Cantilever	OD	Outside Diameter
CBC	California Building Code	OSB	Oriented Strand Board
CIP	Cast-in-place	OSHPD	Office of State Health Planning and Development
CJ	Control Joint		
CJP	Complete Joint Penetration	OWSJ	Open Web Steel Joist
℄	Centerline		
CLG.	Ceiling	PEN.	Penetration
CLR.	Clear	PL.	Plate
CMU	Concrete Masonry Unit	PLYWD.	Plywood
COL.	Column	PJP	Partial Joint Penetration
CONC.	Concrete	psi	Pounds per Square Inch
CONN.	Connection	PSF	Pounds per Square Foot
CONST.	Construction	PSL	Parallel Strand Lumber (Paralam)
CONT.	Continue, Continuous		
CSK.	Countersink	PEMB	Pre-Engineered Metal Building
		PERF.	Perforated
Ø	Diameter	PTDF	Pressure Treated Douglas Fir
d	Penny	PW	Puddle Weld
DBL.	Double		
DCW	Demand Critical Weld	Q.A.	Quality Assurance
DET.	Detail	Q.C.	Quality Control
DEMO	Demolition		
DF	Douglas Fir	RBS	Reduced Beam Section
DIAG.	Diagonal	RDWD	Redwood
DL	Dead Load	REBAR	Reinforcing Bar
DSA	Division of State Architect	REINF.	Reinforcement
DWGS.	Drawings	RET.	Retaining
		REQ'D	Required
EA.	Each		
E.F.	Each Face	S.F.	Square Feet
ELEC.	Electric, Electrical	SHT.	Sheet
ELEV.	Elevation	SHT'G	Sheathing
EMBED.	Embedded, Embedment	SIM.	Similar
E.N.	Edge Nailing	SIP	Structural Insulated Panel
EOR	Engineer of Record	SJI	Steel Joist Institute
EQ	Equal	SLRS	Seismic Load Resisting System
EQUIP.	Equipment	SMS	Sheet Metal Screw
E.S.	Each Side	SQ.	Square
E.W.	Each Way	SS	Select Structural
(E)	Existing	STAGG'D	Staggered
EXP.	Expansion	STD.	Standard
EXT.	Exterior	STL.	Steel
		SW	Shearwall
FAB.	Fabricated	SEOR	Structural Engineer of Record
FDN.	Foundation		
F.F.	Finish floor	T&B	Top and bottom
FLR.	Floor	T&G	Tongue and Groove
F.O.	Face of _____	THR'D	Threaded
FRMG.	Framing	T.O.	Top of _____
FT.	Foot,Feet	TRL.	Triple
FTG.	Footing	TYP.	Typical
GA.	Gauge	UNBLKD.	Unblocked
GALV.	Galvanized	U.N.O.	Unless Noted Otherwise
GEOR	Geotechnical Engineer of Record	URM	Unreinforced Masonry
GLB	Glued-Laminated Beam	VERT.	Vertical
GYP. BD.	Gypsum Board	VIF	Verify in Field
HDR.	Header	w/	With
HD.	Holdown	w/c	Water/Cement Ratio
HORIZ.	Horizontal	WD.	Wood
HSS	Hollow Steel Section	W.P.	Working Point
HT.	Height	W.S.M.F.	Welded Steel Moment Frame
		WSS	Welded Steel Stud
		WT.	Weight
		WWM	Welded Wire Mesh

SYMBOLS

- Concrete Footing
- Concrete Masonry Unit Wall
- Elevation Reference
- Elevation Reference
- DET / SHT — Detail Number Reference / Sheet Number Reference
- Existing 2x Stud Wall To Remain
- New 2x Stud Bearing Wall
- Existing Stud Wall to be Removed
- Slab Step
- S — S — Footing Step
- SLOPE — Slab Slope

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REGISTERED PROFESSIONAL ENGINEER — DANIEL E. PARDO — No. 5405 — STRUCTURAL — STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: JANUARY 28, 2026
DESIGNED BY: JK
DRAWN BY: JK
CHECKED BY: MP
DO NOT SCALE DRAWINGS

SHEET CONTENTS
STRUCTURAL NOTES

SHEET NO.:
S-001

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STRUCTURAL NOTES

PRODUCT SCHEDULE

Type	Product	ICC#	IAPMO#	LARR#
Expansion anchor to concrete	Hilti KWIK BOLT TZ2	ESR-4266	-	-
	Simpson Strong-Bolt 2	ESR-3037	-	25891
	DeWalt Power-Stud+ SD1	ESR-2818	-	25787
	DeWalt Power-Stud+ SD2/SD4/SD6	ESR-2502	-	25831
Adhesive anchor to concrete	Hilti HIT-HY 200 V3	ESR-4868	-	-
	Hilti HIT-RE 500 V3	ESR-3814	-	26028
	Simpson SET-3G	ESR-4057	-	-
	DeWalt PE1000+	ESR-2583	-	25849
	DeWalt AC200+	ESR-4027	-	-
Screw anchor to conrete	Hilti KWIK HUS-EZ	ESR-3027	-	25897
	Simpson Titen-HD	ESR-2713	-	-
	Simpson SS Titen Screw	-	0493	26125
	DeWalt Screw-Bolt+	ESR-3889	-	-
Concrete screw	Simpson SS Titen 2	-	0449	-
	ITW/Buildex Tapcon	ESR-2202	-	-
	DeWalt UltraCon+	ESR-3068	-	-
Shotpin (power driven fastener) ***	Hilti Low-Velocity	ESR-2269	-	25675
	ITW Ramset Power-Driven	ESR-1799	-	22668
	Simpson Power-Actuated	ESR-2138	-	25469
	DeWalt Track-It C5	ESR-3275	-	25920
	DeWalt Power-Driven	ESR-2024	-	25304
Concrete reinforcing headed end *	HRC 555 Headed Bars	ESR-2935	0177	25815
	nVent/LENTON Terminator D14	-	0188	25893
	Barsplice ButtonHead	-	0331	25996
	Dextra Bartec	ESR-2166	-	25884
Concrete reinforcing mechanical splices	HRC 500 CouplerS	ESR-2764	-	25347
	nVent/LENTON Threaded Couplers	-	0129	24507
	Barsplice Zap Screwlok Type 2	ESR-3517	-	25366
	Barsplice BPI-GRIP XL	ESR-2299	-	25011
	Dextra Bartec	ESR-1705	-	25615
	Dayton Superior Bar Lock	ESR-2495	-	25342
Form mounted reinf coupler	Dextra Bartec	ESR-1705	-	25615
	nVent/LENTON Threaded Form Savers	-	0129	24507
Welded studs	Nelson Studs	ESR-2856	-	02725
	Stud Welding Associates Shear Connector Studs	ESR-1094	-	-
	Tru-Weld Headed Stud Anchors	ESR-2577	-	24330
Welded bar anchors	Nelson Deformed Bar Anchors	ESR-2907	-	25860
	Tru-Weld Deformed Bar Anchors	ESR-2823	-	25887
Metal deck	Verco Deck	-	0217	23789
	ASC Steel Roof Deck	ESR-1414	-	23783
	ASC Steel Floor Deck	ESR-2408	-	23783
Concrete slab stud rails	DECON Stud Rails	ESR-2494	-	25395
	Peikko DSA/SSA Shear Rails	ESR-3904	-	-
	Tru-Weld Shear Resistor Studs	ESR-2822	-	25941
	PJ'S Punching Shear Resistors	ESR-3821	-	26070
	Nelson Punching Shear Resistor Studs	ESR-1170	-	25499
	JSW Stud Rails	ESR-3264	-	25930
Sheet metal screw **	Hilti KWIK-PRO	ESR-2196	-	25678
	Hilti KWIK-FLEX	ESR-3332	-	25095
	Simpson X Metal Screws	ESR-3006	0326	25917
	PrimeSource DARTS	ESR-1408	-	25904
	ITW Buildex Teks	ESR-1976	-	25915
	ELCO Dril-Flex	ESR-3332	-	25095
Blind fasteners to steel	LNA BoxBolt Type C	ESR-3217	-	-
	Hollo-Bolt 3 Part / 5 Part	ESR-3330	-	26037

1. For items not noted with a specific product name or manufacturer, the contractor shall provide a product specified in the table above.
2. Products shall be installed per the manufacturer requirements listed in the referenced product reports.
3. Other products not listed the schedule above shall be submitted for review by the Engineer of Record and the Building Official.

SPECIAL INSPECTION

GENERAL NOTES

1. All Special Inspection shall be provided in accordance with CBC Section 1704 and 1705.
2. Where Special Inspection is required, all inspection or testing shall be provided by an "approved agency" in accordance with CBC Section 1702.1, 1703.1 and 1704.1.
3. Special Inspectors shall keep records of inspections. The Special Inspector shall furnish inspection reports to the Authority Having Jurisdiction, and to the Architect or Engineer of Record. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Authority Having Jurisdiction and to the Architect or Engineer of Record prior to the completion of that phase of work. A final report documenting required Special Inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon by the permit applicant and the Authority Having Jurisdiction prior to the start of work.
4. Special Inspectors shall be approved by local Authority Having Jurisdiction in accordance with CBC Section 1704.2.1.
5. Local Authority Having Jurisdictions may require Special Inspection for "Special Cases" in accordance with CBC Section 1705.1.1
6. Contractor's responsibility: Each contractor responsible for the construction of a Main Lateral-Force-Resisting System, listed in the Statement of Special Inspection shall submit a written statement of responsibility to the Authority Having Jurisdiction and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:
   A. Acknowledgement of awareness of the special requirements contained in the statement of special inspections;
   B. Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the Authority Having Jurisdiction;
   C. Procedures for exercised control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
   D. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.
7. Refer to Special Inspection requirements by other disciplines not included herein.

SPECIAL CASES

Verification and Inspection	Cont.	Periodic
Adhesive anchors (Epoxy)		
1. Inspection of anchors installed in hardened concrete. Installed in horizontally or upwardly inclined orientations to resist sustained tension loads. (Concrete shall be cured for a minimum of 21 days)	✓	
2. All other installations of adhesive anchors.		✓
Mechanical anchors		
1. Inspection of anchors installed in hardened concrete.		✓

SOILS[a]

Verification and Inspection	Cont.	Periodic
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.		✓
2. Verify excavations are extended to proper depth and have reached proper material.		✓
3. Perform classification and testing of compacted fill materials.		✓
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	✓	b
5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.		✓

Notes: Soils

a. CBC Section 1705.6 and Table 1705.6

b. With the approval of the Authority Having Jurisdiction and the recommendation of the Geotechnical Engineer of Record, Special Inspection of grading operations may be periodic per CBC Section 1704.2, Exception 1.

HELICAL PILE FOUNDATIONS[a]

Verification and Inspection	Cont.	Periodic
1. Verify installation equipment used, pile dimensions, tip elevations, final depth, and final installation torque comply with the requirements.	✓	
2. Verify other installation data as required by the Registered Design Professional in Responsible Charge.	✓	

Notes: Helical Pile Foundation

a. CBC Section 1705.9

CONCRETE CONSTRUCTION[a,c]

Verification and Inspection	Cont.	Periodic	Referenced Standard	2019 CBC Reference
1. Inspection of reinforcing steel and placement.		✓	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1 - 26.6.3	1908.4
2. Reinforcing bar welding:				
a. Verify weldability of reinforcing bar other than ASTM A706		✓	AWS D1.4 ACI 318: 26.6.4	
b. Inspect single-pass fillet welds, maximum $\frac{5}{16}$"		✓		
c. Inspect all other welds.	✓			
3. Inspection of anchors cast in concrete.		✓	ACI 318: 17.8.2	
4. Inspect anchors post-installed in hardened concrete member.[a,d]				
a. Adhesive anchors installed in horizontally or upward inclined orientations to resist sustained tension loads.	✓		ACI 318: 17.8.2.4	
b. Mechanical anchors and adhesive anchors not defined in 4.a.		✓	ACI 318: 17.8.2	
5. Verifying use of required design mix.		✓	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	✓		ASTM C172 ASTM C31 ACI 318: 26.5 26.12	1908.10
7. Inspection of concrete placement for proper application techniques.	✓		ACI 318: 26.5	1908.6, 1908.7, 1908.8
8. Verify maintenance of specified curing temperature and techniques.		✓	ACI 318: 26.5.3 - 26.5.5	1908.9
9. Inspect formwork for shape, location and dimensions of the concrete member being formed.		✓	ACI 318: 26.11.1.2 (b)	

Notes: Concrete Construction

a. Where applicable, see also CBC Section 1705.12, Special Inspections for seismic resistance

b. Specific requirements for Special Inspection shall be included in the research report for the anchor issued by an approved source in accordance with ACI 318-14 Section 17.8.2 or other requirements. Where specific requirements are not provided, Special Inspection requirements shall be specified by the Registered Design Professional and shall be approved by the Building Official prior to the commencement of the work.

c. CBC Section 1705.3 and Table 1705.3

d. See Special Cases Special Inspection for more requirements

STEEL CONSTRUCTION[a,b]

Verification and Inspection	Cont.	Periodic
Inspection tasks prior to welding		
1. Welder qualification records and continuity records		✓
2. Welding procedure specifications (WPSs) available	✓	
3. Manufacturer certifications for welding consumables available	✓	
4. Material identification (type/grade)		✓
5. Welder identification system[c]		✓
6. Fit-up of groove welds (including joint geometry): Joint preparation, dimensions, cleanliness, tacking, backing type and fit		✓
7. Fit-up of CJP groove welds of HSS T-, Y- and K-joints without backing (including joint geometry): Joint preparations, dimensions, cleanliness and tacking	✓	
8. Configuration and finish of access holes		✓
9. Fit-up of fillet welds: Dimensions, cleanliness, tacking		✓
10. Check welding equipment		
Inspection tasks during welding		
1. Use of qualified welders		✓
2. Control and handling of welding consumables: Packaging, exposure control		✓
3. No welding over cracked tack welds		✓
4. Environmental conditions: Wind speed within limits, precipitation and temperature		✓
5. WPS followed: Settings on welding equipment, travel speed, selected welding materials, shielding gas type/flow rate, preheat applied, interpass temperature maintained min./max.),proper position (F, V, H, OH)		✓
6. Welding techniques: Interpass and final cleaning, each pass within profile limitations, each pass meets quality requirements		✓
7. Placement and installation of steel headed stud anchors	✓	
Inspection tasks after welding		
1. Welds cleaned		✓
2. Size, length and location of welds	✓	
3. Welds meet visual acceptance criteria: Crack prohibition, weld/base-metal fusion, crater cross section, weld profiles, weld size, undercut, porosity	✓	
4. Arc strikes	✓	
5. k-Area[d]	✓	
6. Placement of reinforceing or contouring fillet welds (if required)	✓	
7. Backing removed and weld tabs removed (if required)	✓	
8. Repair activies	✓	
9. Document acceptance or rejection of welded joint or member	✓	
10. No prohibited welds have been added without the approval of the EOR		✓
Inspection tasks prior to bolting[f]		
1. Manufacturer's certifications available for fastener materials	✓	
2. Fasteners marked in accordance with ASTM requirements		✓
3. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		✓
4. Proper bolting procedure selected for joint detail		✓
5. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements		✓
6. Pre-installation certification testing by installation personnel observed and documented for fastener assemblies and methods used		✓
7. Proper storage provided for bolts, nuts, washer and other fastener components		✓
Inspection tasks during bolting		
1. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required		✓
2. Joint brought to the snug-tight condition prior to the pretensioning operation		✓
3. Fastener component not turned by the wrench prevented from rotating		✓
4. Fasteners are pretensioned in accordance with the RCSC specification, progressing systematically from the most rigid point toward the free edges, see Minimum Bolt Pretension table below		✓
Inspection tasks after bolting		
1. Document acceptance or rejection of bolted connections	✓	

Notes: Steel Construction

a. CBC Section 1705.2 and AISC 360 Chapter N

b. CBC Section 1705.13.1 and AISC 341 Chapter J

c. The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.

d. When welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks within 3 inches of the weld

e. All methods of installation for high strength bolts shall require verification of pre-tension by a Skidmore-Welhelm calibrator for each batch or source of bolts used (see minimum pre-tension chart below).

STEEL CONSTRUCTION[a,b] (CONT.)

Minimum Bolt Pretension (kips)

Bolt size inches	Group A (A325, etc.)	Group B. (A490, etc.)
½" Diameter	12	15
⅝" Diameter	19	24
¾" Diameter	28	35
⅞" Diameter	39	49
1" Diameter	51	64
1⅛" Diameter	56	80
1¼" Diameter	71	102
1⅜" Diameter	85	121
1½" Diameter	103	148

2

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975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

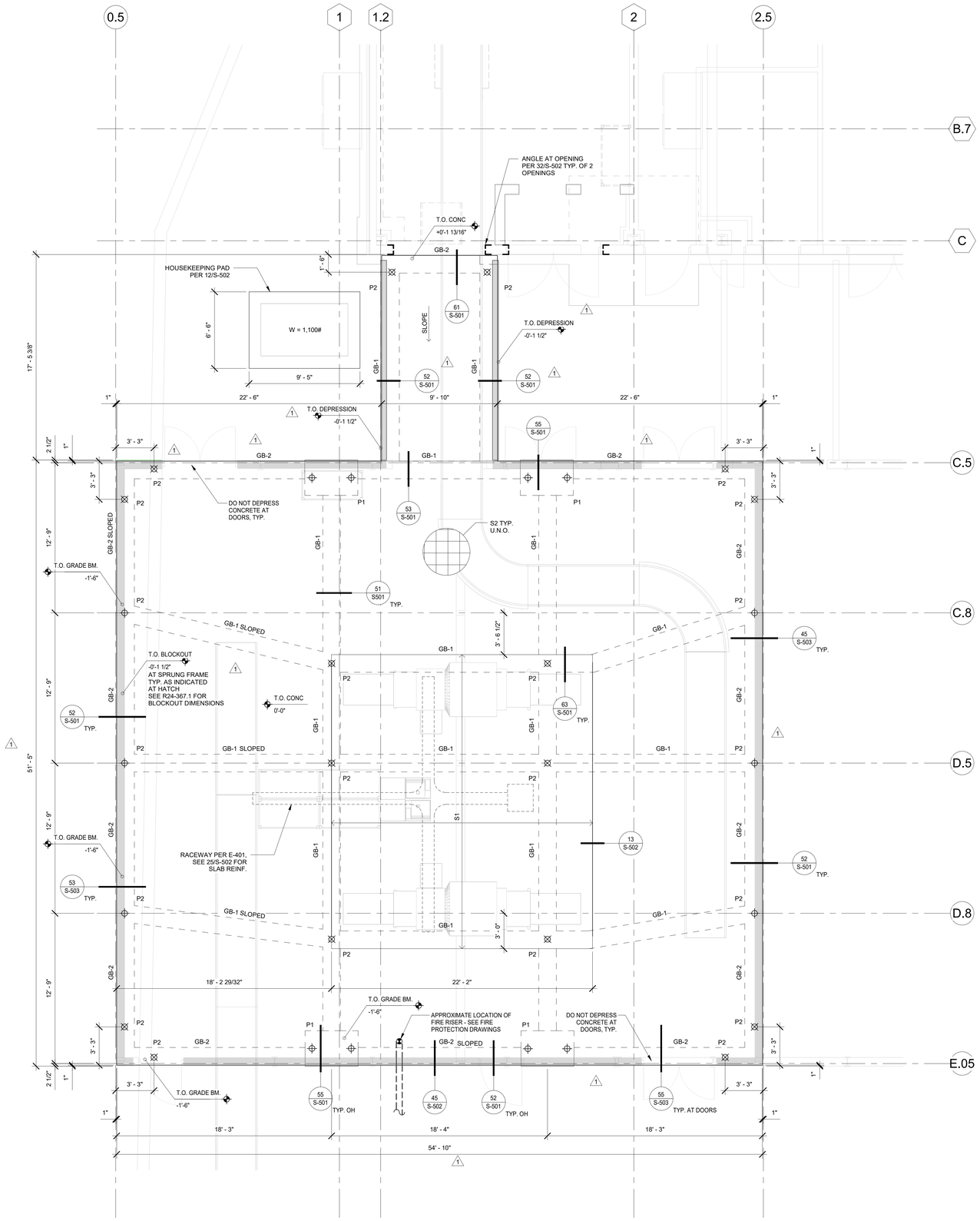
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DESIGNED BY: JK
DRAWN BY: JK
CHECKED BY: MP
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SHEET CONTENTS
STRUCTURAL NOTES

SHEET NO.:
S-002

3/14/2024 1:26:01 PM S:\2023\23133\01 Inbox\2024-03-14 - Revit\Revit Model Update 3_14\240314_Revit Export\222814.02-A-R24_1.T.rvt



1 FOUNDATION PLAN
1/4" = 1'-0"

FOUNDATION NOTES:

1. Top of grade beam or pile cap -1'-0" U.N.O. on plan.
   Top of slab 0'-0" U.N.O. on plan
2. Civil Datum = 198.547'
3. See Structural Notes, Sheet S-001
4. All dimensions are to face concrete, U.N.O.
5. The foundation design is based on the minimum requirements outlined in the Project Geotechnical Report by Earth Systems Pacific, dated February 27, 2024 (Job No. 304536-001)
6. Prior to the Contractor requesting a Building Department Foundation Inspection, the project Geotechnical Engineer shall advise the Building Official in writing that:
   A. The building pad was prepared in accordance with the approved construction documents and project Geotechnical Engineer's recommendations.
   B. The utility trenches have been properly backfilled and compacted.
   C. The foundation excavations comply with the project Geotechnical Engineer's recommendations and are founded into firm competent material.
   D. The soils expansion index is verfied.
7. See S-501 for typical foundation details.
8. See 14/S-502 for slab schedule.
9. Provide 15 mil vapor barrier under slab on grade.
10. Coordinate slab edges with building manufacturer

1

GRADE BEAM SCHEDULE

MARK	DEPTH	WIDTH	REINFORCING		
			TOP BARS	BOTTOM BARS	TIES
GB-1	2'-0"	1'-6"	(3)-#7	(3)-#7	#4 @ 10" o.c.
GB-2	2'-0"	1'-6"	(3)-#6	(3)-#6	#4 @ 10" o.c.

HELICAL PILE AND PILE CAP SCHEDULE

MARK	HELICAL PILE					PILE CAP					
	QUANTITY	GROUP DESIGN DOWN FORCE	GROUP DESIGN UPLIFT	PILE MODEL A.B. CHANCE (ICC ESR-2794)	BRACKET CATALOG NUMBER	DEPTH	WIDTH	LENGTH	REINFORCING		
									TOP BARS	BOTTOM BARS	TIES
P1	2	25 K		SS5	C1500465G	2'-6"	3'-0"	4'-6"	#7 @ 8" o.c.	#7 @ 8" o.c.	#4 @ 12" o.c.
P2	1	17.8 K		SS5	C1500465G						

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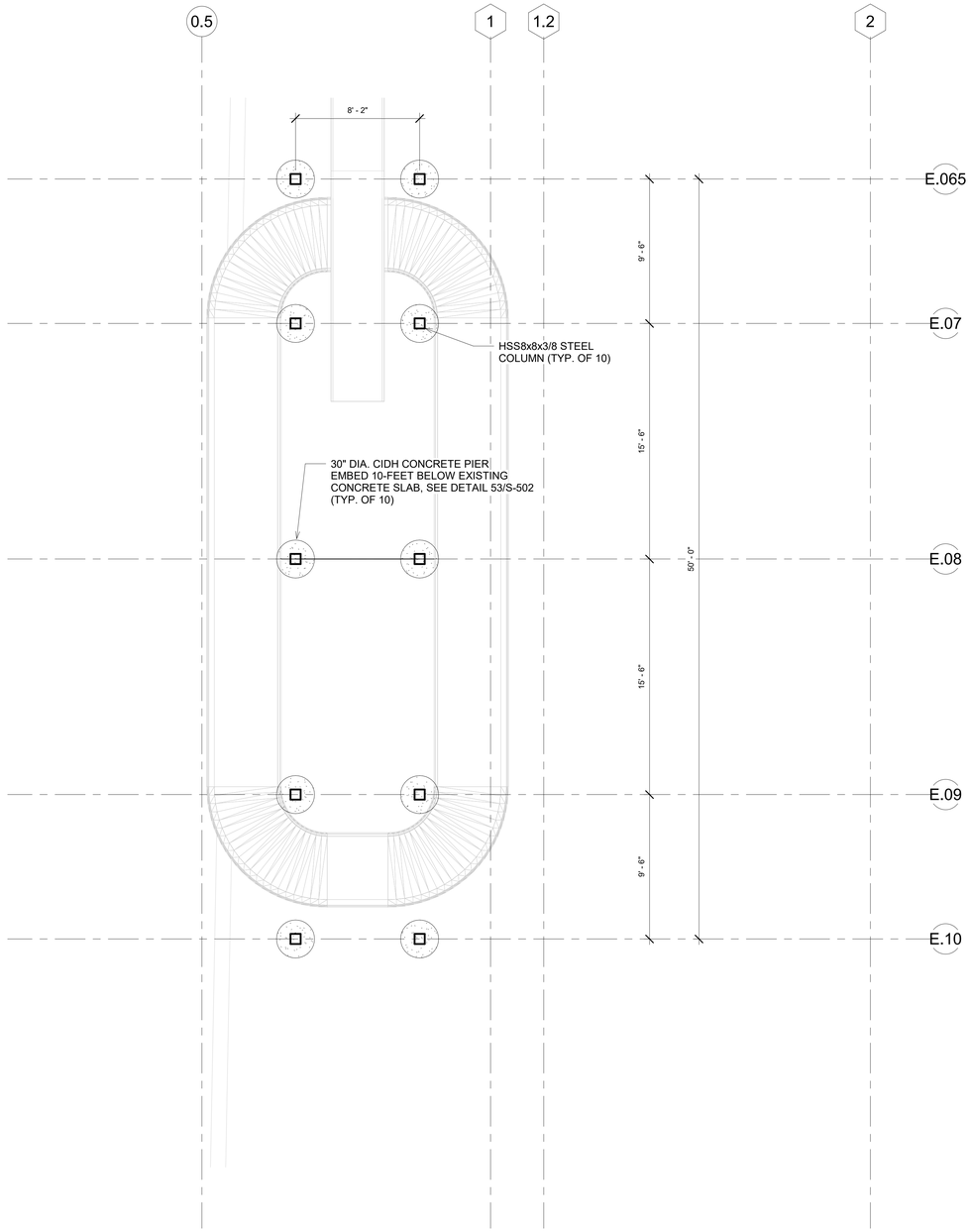
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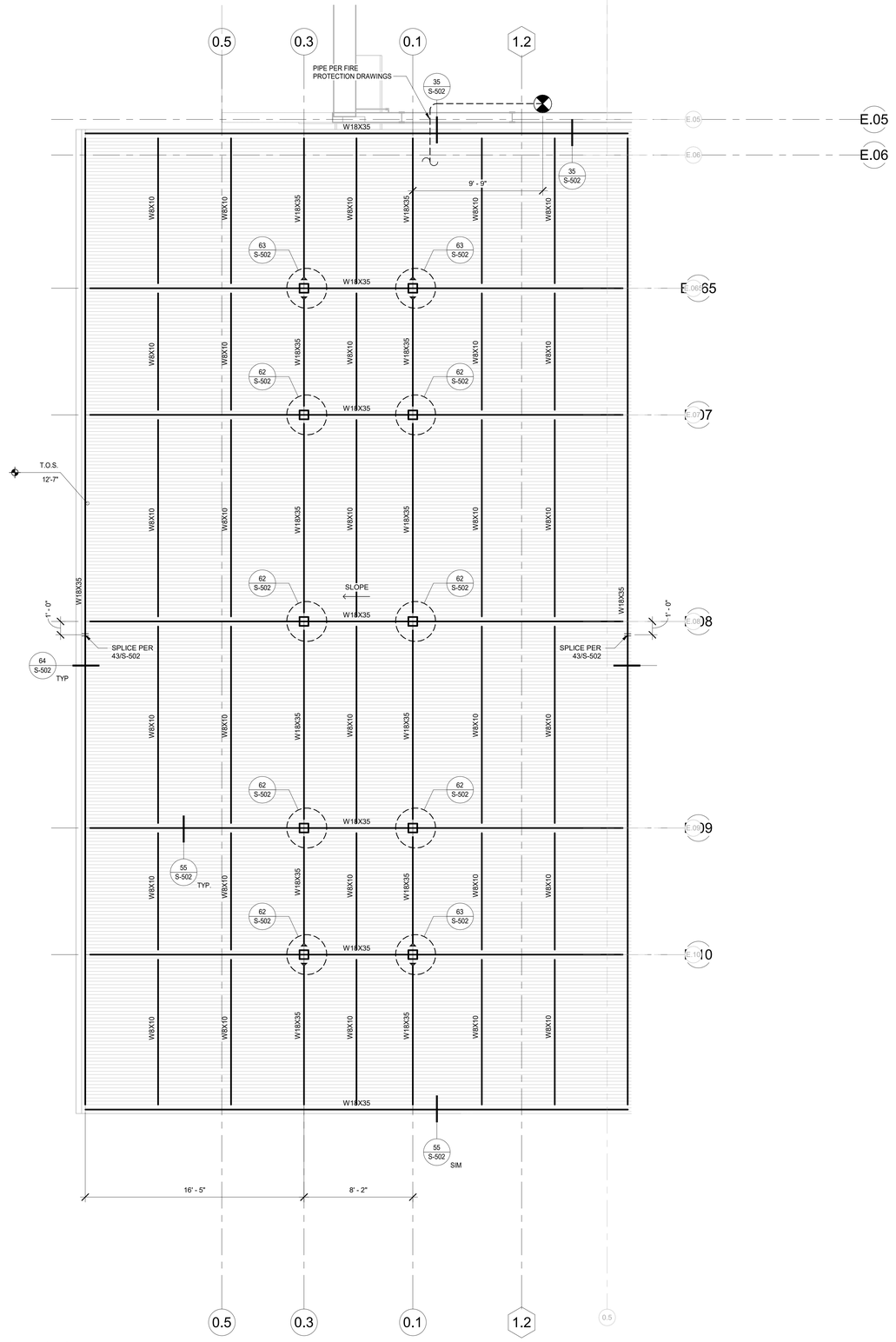
SHEET CONTENTS
FOUNDATION PLAN

SHEET NO.:
S-101

1/28/2026 11:59:18 AM S:\2023\2313303 Production\04 Models\222814.02-S-R24.rvt



1 FOUNDATION PLAN CANOPY
1/4" = 1'-0"



2 FRAMING PLAN CANOPY
1/4" = 1'-0"

NOTES:

1. MAINTAIN MINIMUM 3'-6" CLEAR FROM BOTTOM OF STEEL STRUCTURE TO TOP OF BAGGAGE BELT

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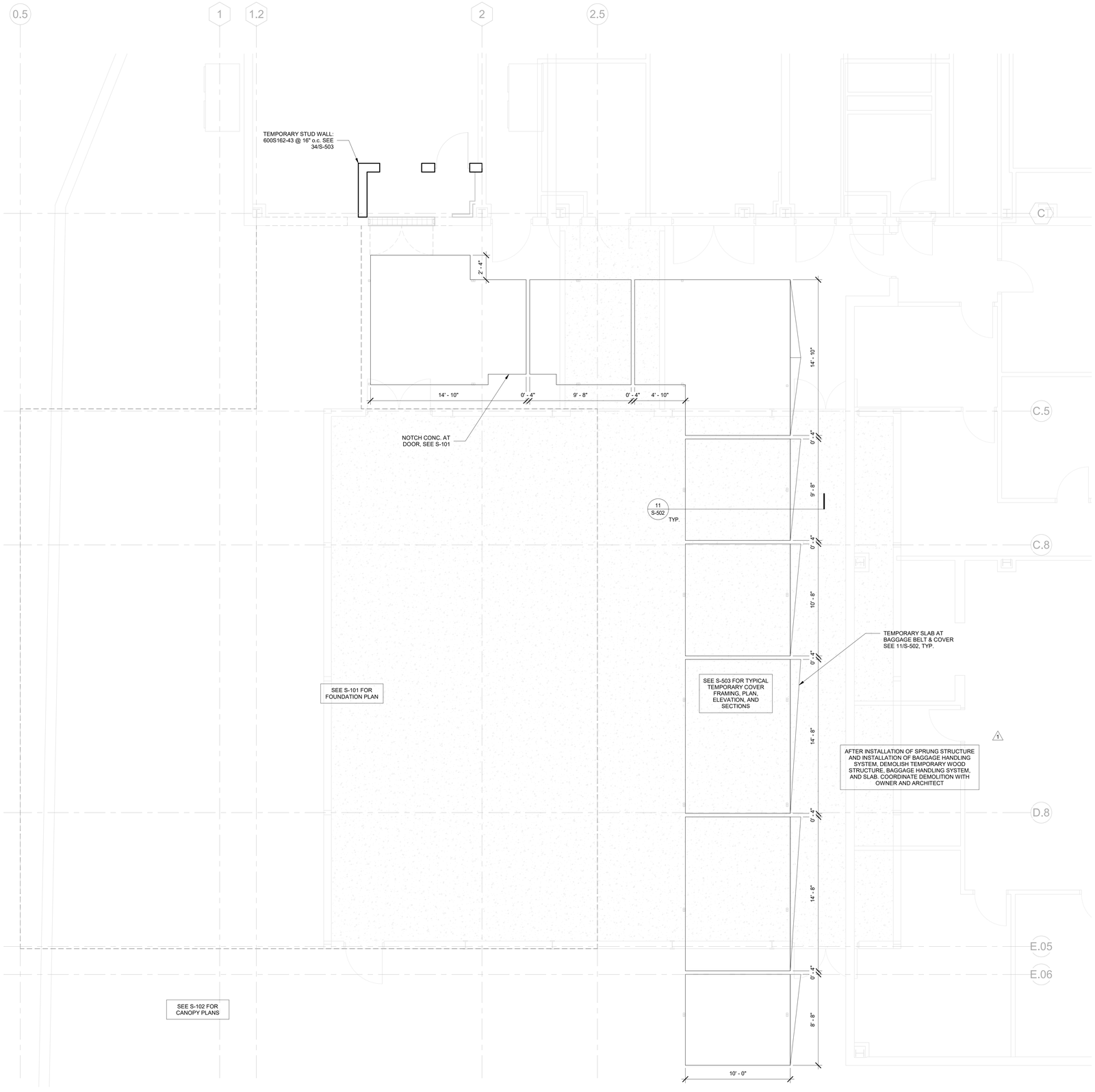
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SHEET CONTENTS
CANOPY FOUNDATION AND FRAMING PLAN

SHEET NO.:
S-102

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1 TEMPORARY BAGGAGE BELT COVER FOUNDATION
1/4" = 1'-0"

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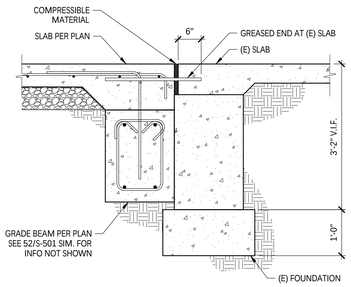
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SHEET CONTENTS
TEMPORARY BAGGAGE BELT COVER FOUNDATION

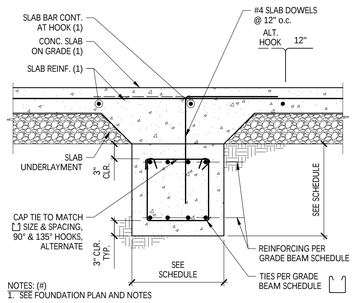
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(N)/(E) FOUNDATION

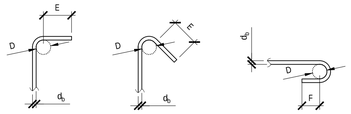
N.T.S. 61



NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES

INTERIOR GRADE BEAM

N.T.S. 51



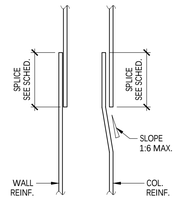
Bar Size	Dimension of Standard Bends		
	D	E ($6d_b$) [3" min.]	F ($4d_b$) [2½" min.]
#3	1½"Ø	3"	2½"
#4	2"Ø	3"	2½"
#5	2½"Ø	3¾"	2½"

TIE AND STIRRUP BENDS

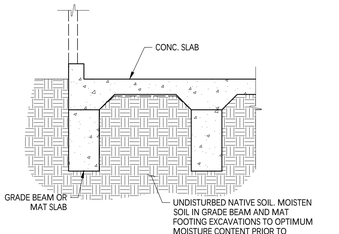
N.T.S. 41

Bar Size	LAP CLASS (3)	Concrete Strength f'_c = 3,000 psi (1)				Concrete Strength f'_c = 4,000 psi (1)				Rebar Yield Strength
		Top Bars (5)		Other Bars		Top Bars (5)		Other Bars		
		Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	f_y (Min.)
#3	A	22"	33"	17"	25"	19"	28"	15"	22"	60 ksi
	B	28"	42"	22"	33"	25"	37"	19"	28"	
#4	A	29"	43"	22"	33"	25"	37"	19"	29"	60 ksi
	B	38"	56"	29"	43"	33"	49"	25"	37"	
#5	A	36"	54"	28"	42"	31"	47"	24"	36"	60 ksi
	B	47"	70"	36"	54"	41"	61"	31"	47"	
#6	A	43"	65"	33"	50"	37"	56"	29"	43"	60 ksi
	B	56"	84"	43"	65"	49"	73"	37"	56"	
#7	A	63"	94"	48"	72"	54"	81"	42"	63"	60 ksi
	B	81"	122"	63"	94"	71"	106"	54"	81"	
#8	A	72"	107"	55"	83"	62"	93"	48"	72"	60 ksi
	B	93"	139"	72"	107"	81"	121"	62"	93"	
#9	A	81"	121"	62"	93"	70"	105"	54"	81"	60 ksi
	B	105"	157"	81"	121"	91"	136"	70"	105"	

BAR SPLICE LENGTH SCHEDULE



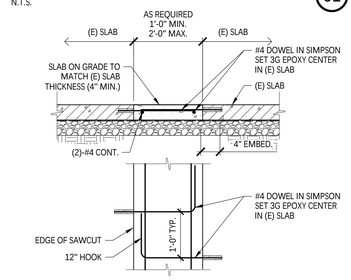
WALL & COLUMN SPLICE



NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES
2. REFER TO SITE PREPARATION AND GRADING NOTES ON ----
3. IF BACKFILL IS REQUIRED ADJACENT TO GRADE BEAMS AND MAT FOUNDATIONS, CONTROLLED LOW STRENGTH MATERIAL (CLSM OR SLURRY) SHALL BE USED FOR BACKFILL RATHER THAN COMPACTED SOIL.

BLDG. PAD PREPARATION

N.T.S. 11

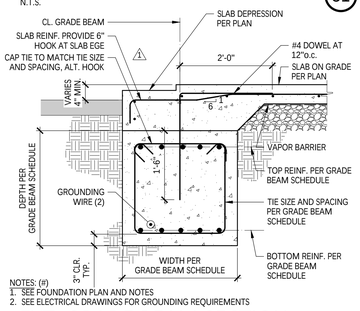


PLAN

NOTES: (#)
1. SEE 14/S-501 FOR CONDITION WHERE SLAB CUT WIDTH EXCEEDS 2'-0"

SLAB REPAIR DETAIL

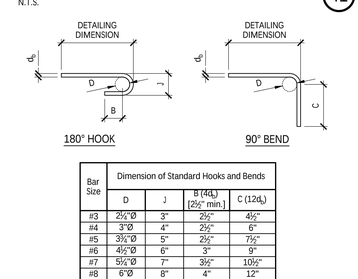
N.T.S. 62



NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES
2. SEE ELECTRICAL DRAWINGS FOR GROUNDING REQUIREMENTS

EXT. GRADE BEAM SECTION

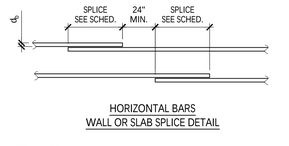
N.T.S. 52



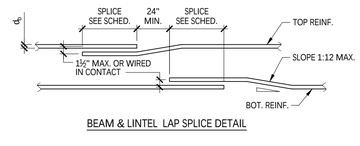
Bar Size	Dimension of Standard Hooks and Bends			
	D	J	B ($4d_b$) [2½" min.]	C ($12d_b$)
#3	2½"Ø	3"	2½"	4½"
#4	3"Ø	4"	2½"	6"
#5	3½"Ø	5"	2½"	7½"
#6	4½"Ø	6"	3"	9"
#7	5½"Ø	7"	3½"	10½"
#8	6"Ø	8"	4"	12"
#9	9"Ø	11½"	4½"	13½"
#10	10"Ø	12½"	5"	15"

REBAR HOOKS & BENDS

N.T.S. 42



HORIZONTAL BARS
WALL OR SLAB SPLICE DETAIL



BEAM & LINTEL LAP SPLICE DETAIL

NOTES: (#)
1. THIS TABLE FOR USE WITH NORMAL WEIGHT HARDROCK CONCRETE. FOR LIGHTWEIGHT AGGREGATE CONCRETE, USE 1.33xL, WHERE L = BASIC LAP SPLICE AS SHOWN IN SCHEDULE
2. WHERE BARS OF A DIFFERENT SIZE ARE LAPPED, THE LAP LENGTH SHALL BE THE LENGTH REQUIRED BY THE LARGER BAR
3. CLASS A - HALF OR LESS OF THE BARS ARE SPLICED WITHIN A REQUIRED LAP LENGTH
   CLASS B - MORE THAN HALF OF THE BARS ARE SPLICED WITHIN A REQUIRED LAP LENGTH
   ALL SPLICES SHALL BE CLASS B U.N.O.
4. CASES 1 AND 2 ARE DEFINED AS FOLLOWS:

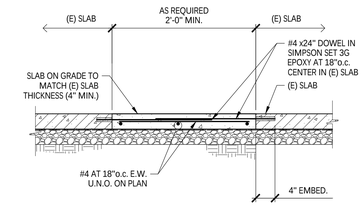
   BEAMS OR COLUMNS:
   CASE 1: COVER AT LEAST $1.0d_b$ AND CENTER TO CENTER SPACING AT LEAST $2.0d_b$
   CASE 2: COVER LESS THAN $1.0d_b$ OR CENTER TO CENTER SPACING LESS THAN $2.0d_b$

   ALL OTHER MEMBERS:
   CASE 1: COVER AT LEAST $1.0d_b$ AND CENTER TO CENTER SPACING AT LEAST $3.0d_b$
   CASE 2: COVER LESS THAN $1.0d_b$ OR CENTER TO CENTER SPACING LESS THAN $3.0d_b$

5. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BAR

TYPICAL REINFORCING LAP SPLICES

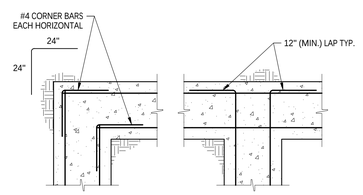
N.T.S. 22



NOTES: (#)
1. SEE 62/S-501 FOR NARROW INTERIOR SAWCUT CONDITION WHERE SLAB CUT WIDTH IS 1'-0" TO 2'-0"

SLAB REPAIR DETAIL

N.T.S. 13

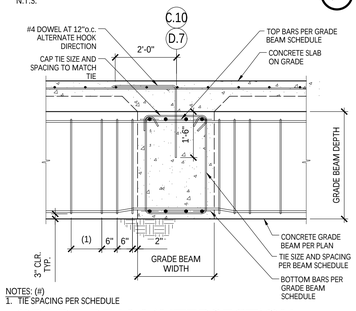


PLAN VIEW

NOTES: (#)
1. TYPICAL HORIZONTAL FOOTING STEEL SHOWN
2. VERTICAL STEEL NOT SHOWN FOR CLARITY
3. SEE SPECIFIC DETAILS FOR STEEL SIZE, NUMBER, AND SPACING

TYP. FOOTING CORNER

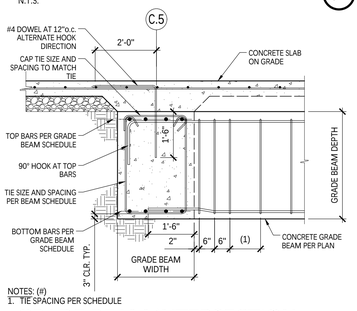
N.T.S. 12



NOTES: (#)
1. TIE SPACING PER SCHEDULE

GRADE BEAM INTERSECTION

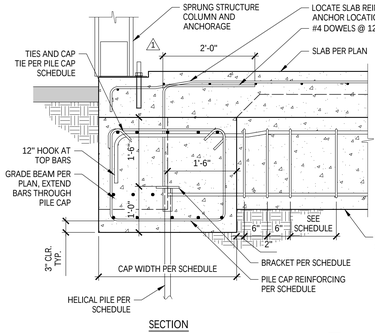
N.T.S. 63



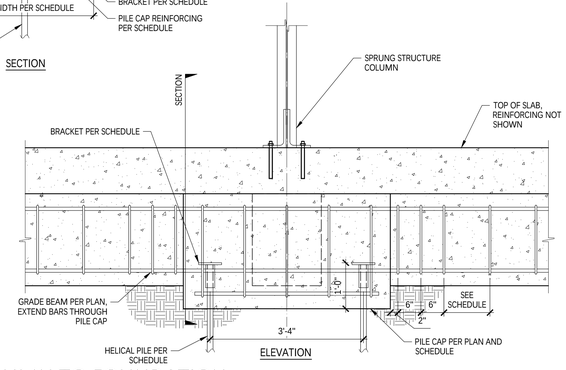
NOTES: (#)
1. TIE SPACING PER SCHEDULE

GRADE BEAM INTERSECTION

N.T.S. 53



SECTION



ELEVATION

SPRUNG COLUMN TO FOUNDATION

N.T.S. 55

CASE 1:
PIPE BELOW GRADE BEAM
WITHIN 12" OF BOTTOM OF FOOTING

CASE 2:
PIPE BELOW GRADE BEAM
WITHIN 36" OF BOTTOM OF FOOTING

CASE 3:
PIPE IN MIDDLE THIRD OF GRADE BEAM

CASE 4:
CONDUIT/PIPE BANK BELOW GRADE BEAM

CASE 5:
MULTIPLE PIPES IN MIDDLE THIRD OF GRADE BEAM

CASE 6:
PIPE IN BOTTOM THIRD OF GRADE BEAM

NOTES:
1. D = DEPTH OF GRADE BEAM
2. D_{SLEEVE} = DIAMETER OF PIPE SLEEVE
3. SLEEVE INSIDE DIAMETER 2" LARGER THAN PIPE OUTSIDE DIAMETER
4. SEAL VOID BETWEEN PIPE AND SLEEVE WITH ELASTIC WATERPROOF MATERIAL
5. FOR PIPES 3'-0" OR GREATER BELOW FOOTING COMPACT BACKFILL OVER PIPE AS INDICATED IN GEOTECHNICAL REPORT OR USE STEPPED FOOTING BELOW PIPE
6. PIPES SHALL NOT BE INSTALLED IN THE TOP OR BOTTOM THIRD OF GRADE BEAM
7. PIPES GREATER THAN D/3 OR 8" SHALL BE PLACED ABOVE OR BELOW GRADE BEAM

PIPE THROUGH GRADE BEAM

N.T.S. 25

REINFORCMENT CLEAR COVER		
USE	BAR SIZE	CLEAR COVER
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	#3 THROUGH #11	3"
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER	#6 THROUGH #11	2"
	#5 AND SMALLER	1½"
WALLS	#11 AND SMALLER	¾"
BEAMS	#11 AND SMALLER	1½"
SLABS	#6 THROUGH #11	¾"
	#5 AND SMALLER	½"

TYPICAL CONCRETE COVER

N.T.S. 14

Mead & Hunt
Mead & Hunt, Inc.
3110 E. Guasti Road.
Suite 330
Ontario, CA 91761
phone: 909-467-8560
meadhunt.com

BUEHLER
811 EL CAPITAN WAY, SUITE 240
SAN LUIS OBISPO, CA 93401
805 439 2110

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REGISTERED PROFESSIONAL ENGINEER
LAUREL E. PARKS
No. 5405
STRUCTURAL
STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

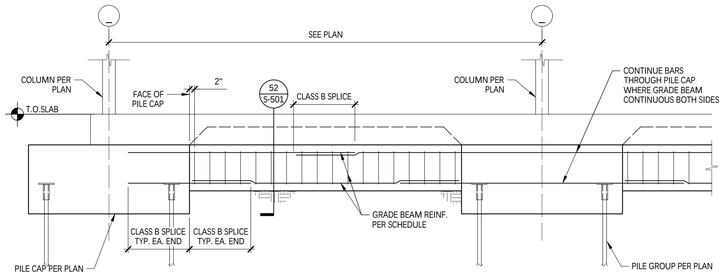
ISSUED
09/03/25 ISSUED FOR PERMIT
1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: JANUARY 28, 2026
DESIGNED BY: JK
DRAWN BY: JK
CHECKED BY: MP
DO NOT SCALE DRAWINGS

SHEET CONTENTS
FOUNDATION DETAILS

SHEET NO.:
S-501

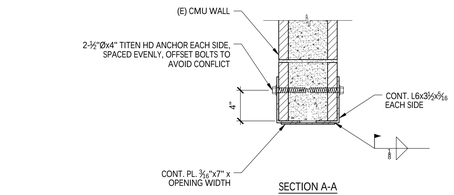
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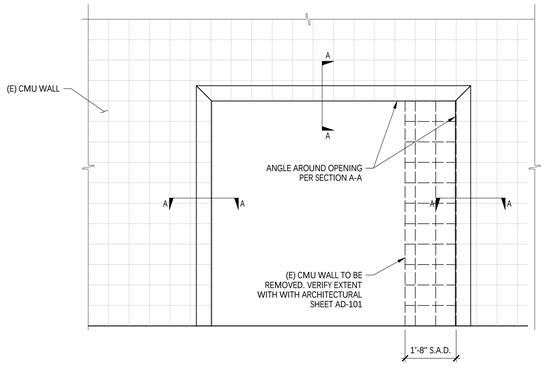
NOTES: (#)
1. COLUMN, PILE CAP, AND SLAB REINFORCEMENT NOT SHOWN

TYPICAL GRADE BEAM REINFORCMENT 51

N.T.S.

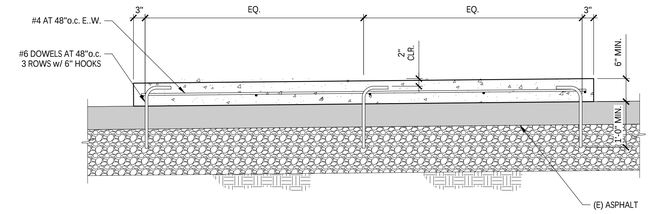


SECTION A-A



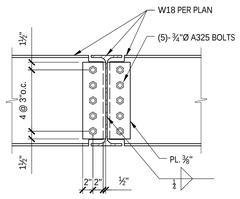
ENLARGED OPENING IN (E) CMU WALL 32

N.T.S.



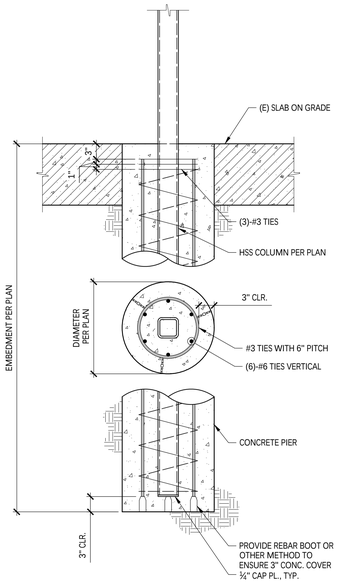
TEMPORARY BAGGAGE BELT COVER SLAB 11

N.T.S.



W18 TO W18 CONNECTION 62

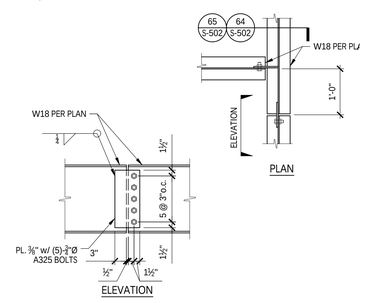
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NOTES: (#)
1. SEE FRAMING/FOUNDATION PLAN AND NOTES

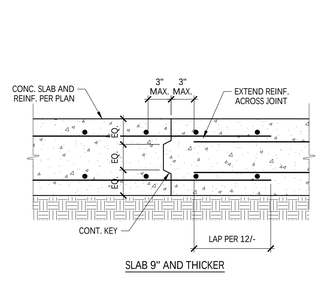
CONCRETE DRILLED PIER 53

N.T.S.

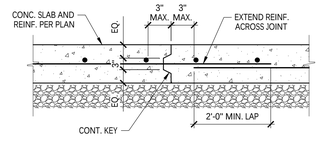


FASCIA BEAM SPLICE 43

N.T.S.



SLAB 9" AND THICKER

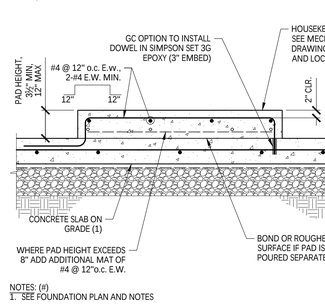


SLAB 8" THICK OR LESS

NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES

TYPICAL CONST. JOINT 34

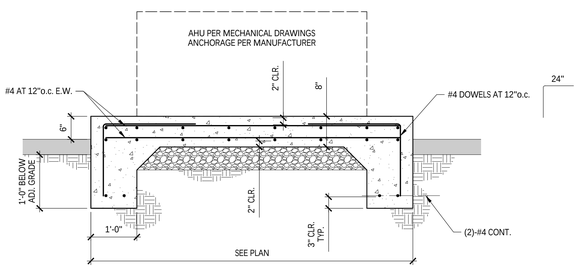
N.T.S.



NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES

HOUSEKEEPING SLAB 23

N.T.S.



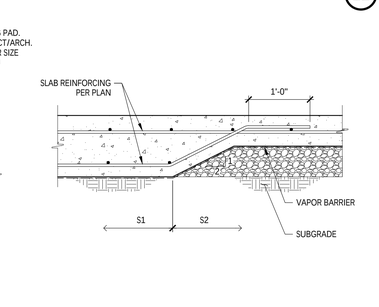
HOUSEKEEPING PAD 12

N.T.S.

SLAB SCHEDULE				
MARK	THICKNESS	TYPICAL REINFORCEMENT		REMARKS
		TOP	BOTTOM	
S1	12"	#5 @ 12"o.c. E.W.	#5 @ 12"o.c. E.W.	
S2	6"	#4 @ 12"o.c. E.W.		CENTER REINF. IN SLAB

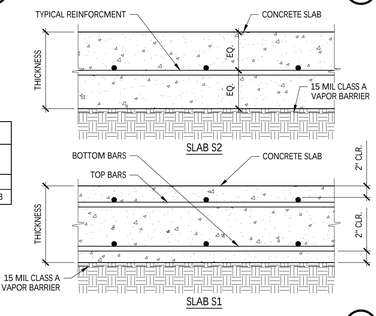
SLAB SCHEDULE 14

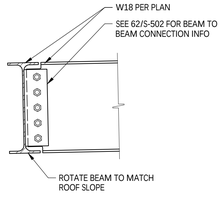
N.T.S.



SLAB TRANSITION 13

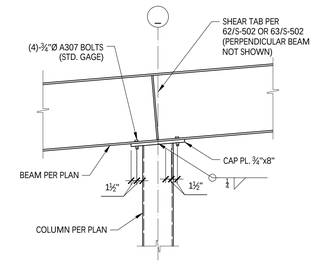
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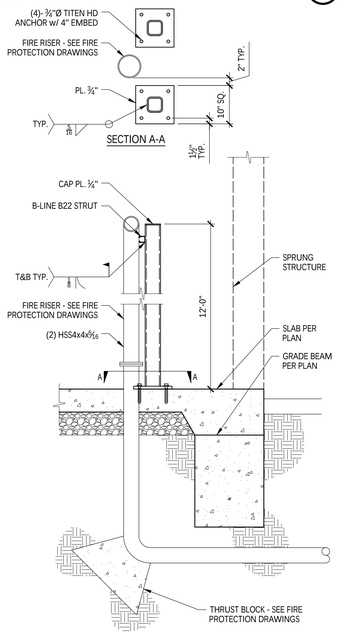
LOW EAVE 64

N.T.S.



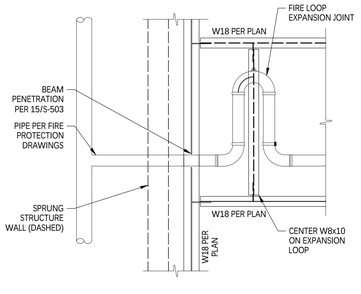
BEAM TO COLUMN 54

N.T.S.



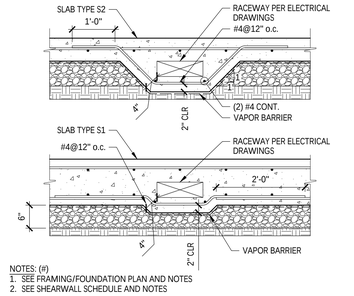
FIRE RISER SUPPORT 45

N.T.S.



PLAN - FRMG. AT FLEX JOINT 34

N.T.S.



NOTES: (#)
1. SEE FRAMING/FOUNDATION PLAN AND NOTES
2. SEE SHEARWALL SCHEDULE AND NOTES

RACEWAY IN SLAB 25

N.T.S.

HIGH EAVE 65

N.T.S.

W8 TO W18 CONNECTION 55

N.T.S.

Mead & Hunt
Mead & Hunt, Inc.
3110 E. Guasti Road.
Suite 330
Ontario, CA 91761
phone: 909-467-8560
meadhunt.com

BUEHLER
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REGISTERED PROFESSIONAL ENGINEER
LIONEL E. PARDO
No. 5405
STRUCTURAL
STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

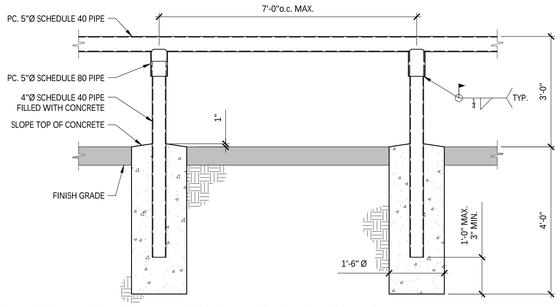
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1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: JANUARY 28, 2026
DESIGNED BY: JK
DRAWN BY: JK
CHECKED BY: MP
DO NOT SCALE DRAWINGS

SHEET CONTENTS
DETAILS

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S-502

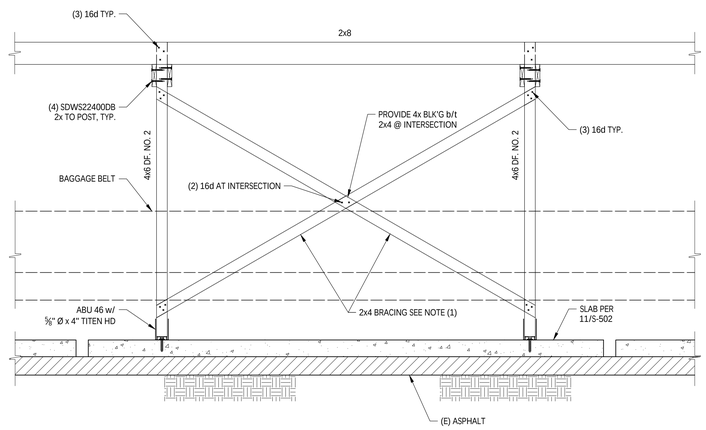
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IMPACT PROTECTION AT SPRUNG STRUCTURE

N.T.S.

52

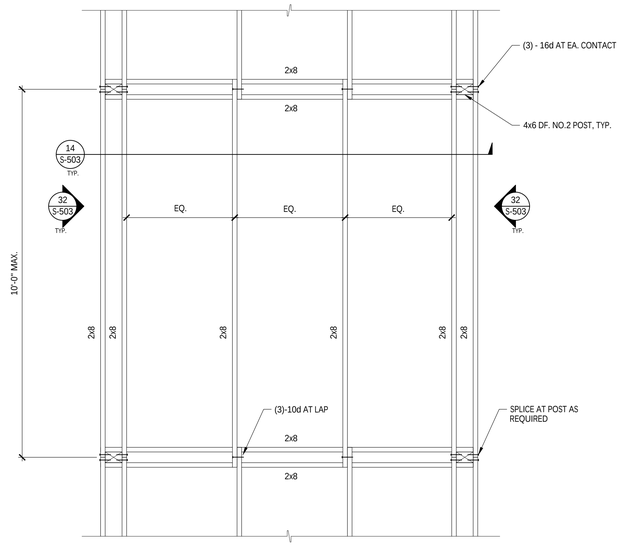


NOTES: (#)
1. BRACE EVERY THIRD BAY, MINIMUM

TYPICAL ELEVATION

N.T.S.

32

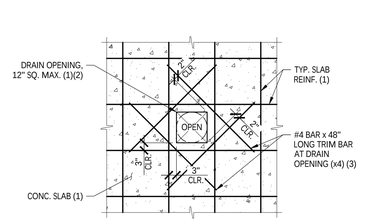


NOTES: (#)
1. ALL FRAMING SHALL BE DF No.2 OR BETTER

TYPICAL TEMPORARY COVER FRAMING PLAN

N.T.S.

12

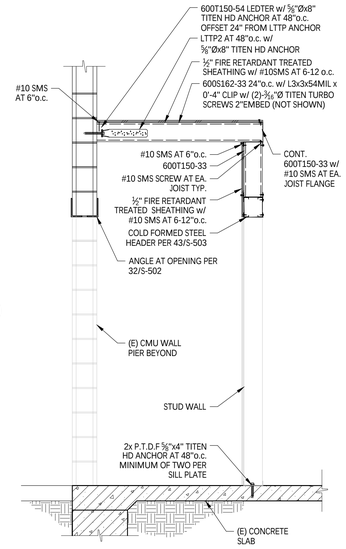


NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES
2. SEE ARCHITECTURAL PLAN
3. OR 1" WITHIN FACE OF CURB AT WALL

OPENING IN S.O.G.

N.T.S.

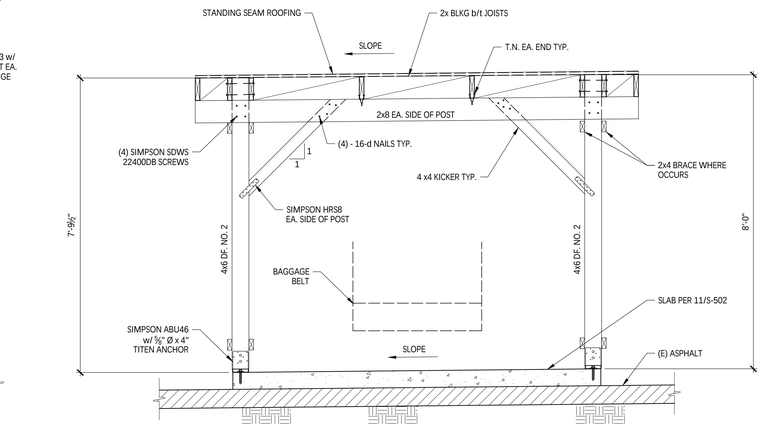
43



TEMPORARY STUD WALL

N.T.S.

34

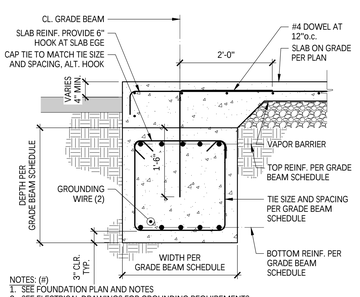


NOTES: (#)
1. ALL FRAMING SHALL BE DF No.2 OR BETTER

TYPICAL SECTION

N.T.S.

14

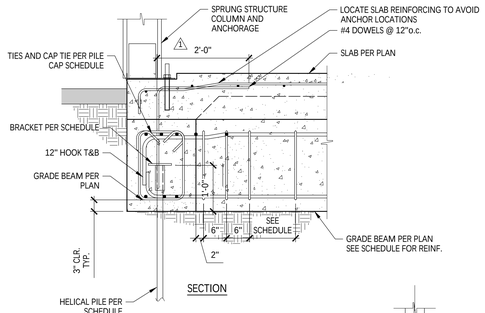


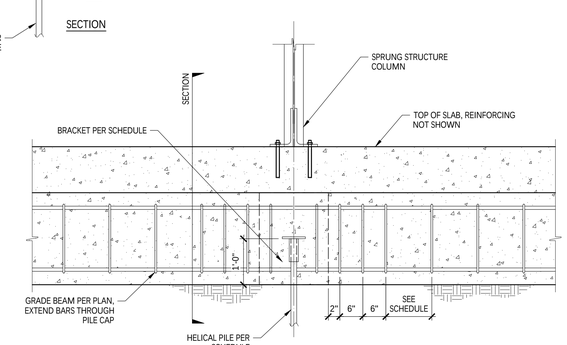
NOTES: (#)
1. SEE FOUNDATION PLAN AND NOTES
2. SEE ELECTRICAL DRAWINGS FOR GROUNDING REQUIREMENTS

EXT. GRADE BEAM AT DOOR

N.T.S.

55

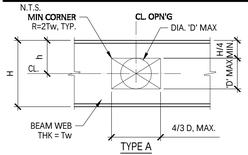




SPRUNG COLUMN TO FOUNDATION

N.T.S.

45



TYPE A

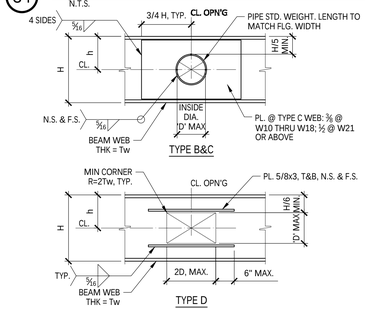
TABLE OF UNSCHEDULED PENETRATIONS				
	'D' MAX			
	TABLE A	TABLE B	TABLE C	TABLE D
	H/5	H/3	H/2	H/3

NOTES:
1. NO PENETRATIONS SHALL BE PALCED IN BEAMS IN BRACED OR MOMENT FRAMES, OR TRUSS MEMBERS, PER THIS DETAIL.
2. CONTRACTOR SHALL COORDINATE PENETRATION SIZES WITH FIREPROOFING REQUIREMENTS.
3. ERECTED BEAM SHALL BE SHORED FOR NEW WEB PENETRATION.
4. ALL BEAM WEB PENETRATIONS ARE SUBJECT TO REVIEW AND APPROVAL BY SEOR.

BEAM PENETRATION

N.T.S.

25



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Mead & Hunt, Inc.
3110 E. Guasti Road.
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Ontario, CA 91761
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BUEHLER
811 EL CAPITAN WAY, SUITE 240
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REGISTERED PROFESSIONAL ENGINEER DANIEL E. PARKS No. 5405 STRUCTURAL STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: JANUARY 28, 2026
DESIGNED BY: JK
DRAWN BY: JK
CHECKED BY: MP
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SHEET CONTENTS
DETAILS

SHEET NO.:
S-503

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GENERAL NOTES

STRUCTURE LOCATION

975 AIRPORT DRIVE
SAN LUIS OBISPO, CA 93401

DESIGN CRITERIA

CODES AND STANDARDS
2022 CARLIFORNIA BUILDING CODE (CBC)
ASCE 7-16
AISC 360-16
ASCE 55-16

VERTICAL LOADS ROOF
DEAD LOAD = SELF WEIGHT + 3.4 PSF (FABRIC & UTILITY)
LIVE LOAD = 0 PSF (BOUNDARY-LESS SHAPE OF THE SHELL COUPLED WITH THE SLIPPERY CANVAS DOES NOT PERMIT SAFE ACCESS TO THE TOPSIDE, NOR CAN ANY RE-ROOFING WORK BE UNDERTAKEN)
ROOF SNOW LOAD = 0 PSF
GROUND SNOW LOAD=0PSF
Ce=1.0, Ct=1.0, Cs=0.68, Is=1.1
FOR SNOW AREAS ONLY - THIS STRUCTURE IS DESIGNED TO SHED/RELEASE SNOW, THE PERIMETER OF THE STRUCTURE SHALL BE KEPT CLEAR.

LATERAL LOADS
SEISMIC
RISK CATEGORY: III
SEISMIC DESIGN CATEGORY: D
SITE CLASS: D - DEFAULT
SS = 1.072
S1 = 0.394
Fa = 1.2
Fv = 1.906
SDS = 0.858
SD1 = 0.501
PGA = 0.475
ALTERNATIVE STRUCTURAL SYSTEMS GOVERN SEISMIC DESIGN (ASCE 7-16 SECTION 12.2.1.1)
R=3.0 ALUMINUM ORDINARY MOMENT FRAME, TRANSVERSE (ADM 2020 PART II SECTION B.2.1)
R=3.0 ALUMINUM ORDINARY CONCENTRICALLY BRACED FRAME, LENGTHWISE (LESS DUCTILE THAN STEEL OCBF W/ R=3.25)
BUILDING HEIGHT= 24'-11"
IE = 1.25
Ωo = 2.5
Cd = 3.0
IP(Component Importance Factor) = 1.0
CS = 0.357
STRUCTURE'S WEIGHT W = 21.88 KIPS
SEISMIC BASE SHEAR = WxCs =7.9 KIPS (ASD)
SEISMIC FORCE RESISTING SYSTEM: MOMENT RESISTING FRAME (SHORT DIRECTION) AND CABLE BRACED (LONG DIRECTION)
ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE
LINEAR STATIC WIND
VULT = 99 MPH
RISK CATEGORY: III
EXPOSURE CATEGORY: C
GCPI = ±0.18

UTILITY LOADS

SPRUNG STRUCTURES ARE DESIGNED TO SUPPORT AN AVERAGE AND BALANCED UTILITY LOAD OF 2 PSF, COMPRISED OF SUCH ITEMS AS SPRINKLER LINES, HVAC DUCTS, ELECTRICAL, LIGHTING, FANS, CEILING GRIDS, AUDIO-VISUAL EQUIPMENT, ETC. THE SEISMIC EFFECT AND FORCES CAUSED BY THE UTILITY LOAD ALLOWANCE ARE TAKEN INTO CONSIDERATION IN THE DESIGN OF THE STRUCTURE.

FOR MANY STRUCTURES, THE WIND EFFECT FROM THE DESIGN WIND SPEED EXCEEDS THE FORCES THE STRUCTURE WILL SEE FROM THE SEISMIC DEMAND CAUSED BY THE PROPOSED SUSPENDED UTILITIES. REGARDLESS OF WHAT CONTROLS ENGINEERING REQUIREMENTS, ALL STRUCTURAL DESIGNS INCLUDE THIS 2-PSF UTILITY LOAD ALLOWANCE, AND ARE ENSURED TO HAVE SUFFICIENT CAPACITY TO UNIFORMLY SUPPORT IT.

THE MAXIMUM CONCENTRATED LOAD AT ANY ATTACHMENT POINT IS 300 LBS.

CONCENTRATED LOADS GREATER THAN 300 LBS MUST BE APPROVED BY SPRUNG, AND IF PRESENT, REQUIRE A PROJECT SPECIFIC UTILITY LOAD STUDY TO BE CONDUCTED.

ATTACHMENT OF THE UTILITIES MUST ONLY BE TO THE BOTTOM FLANGE OF THE (FRAME) BEAM AND CAN BE ACHIEVED USING THE FLANGE`S BOLT CHASE (3/8" DIA. FOR 5X10 BEAMS & 1/2" DIA. FOR 8x12 BEAMS). FOR STRUCTURES WITHOUT AN INTERIOR LINER, APPROVED SPECIALTY BEAM CLAMPS OR THE BOLT CHASE MAY BE USED TO ATTACH UTILITIES TO THE ALUMINUM ARCHES. BEAM CLAMPS SHALL ENGAGE THE BOTTOM FLANGE OF THE ARCH BEAM ON BOTH SIDES OF THE WEB BEAM CLAMPS SHALL NOT ENGAGE THE ROPE CHASE. ECCENTRIC CONNECTIONS TO THE FLANGE ARE NOT PERMITTED, REGARDLESS OF ATTACHMENT METHOD.

NO UTILITY LOADS CAN BE ATTACHED TO THE (FRAME) BEAMS WITH SCREWS OR OTHER METHODS THAT PUNCTURE THE BEAM`S FLANGES OR WEB. UNDER NO CIRCUMSTANCES CAN LOADS BE ATTACHED TO PURLINS/SPREADERS OR CABLES. ANY ATTACHMENT TO THE STRUCTURE SHOULD BE FLEXIBLE ENOUGH TO ALLOW FOR THE MOVEMENT OF THE STRUCTURE IN HIGH WIND CONDITIONS. ALL METHODS AND DESIGN OF ATTACHMENT OF THE UTILITIES TO THE STRUCTURE ARE THE RESPONSIBILITY OF YOUR CLIENT `S ENGINEER.

QUALITY CONTROL

ISO 9001:2021
INSPECTION DOCUMENTATION IS AS PER THE ISO STANDARD AND AS PER ADM CHAPTER N.2.

ALUMINUM:
- MIL CERTS ARE CHECKED FOR CONFORMANCE WITH SPRUNG'S SPECIFICATIONS.
- ALUMINUM PROFILES ARE RANDOMLY SELECTED TO ENSURE CONFORMANCE TO ASTM B209-14.
- ALL CURVED SECTIONS FROM BENDERS ARE TO BE PLACED IN A JIG AND CHECKED FOR GEOMETRIC TOLERANCES.
- MANUFACTURING CONSIST OF CUTTING OF THE ALUMINUM EXTRUSIONS, DRILLING OF HOLES C&C MACHINES AND PUNCH PRESSES WITH DIES.
- FABRICATED PARTS ARE VISUALLY CHECKED TO ENSURE IT CONFORMS WITH SHOP DRAWINGS.

STEEL PARTS:
- ALL WELDED STRUCTURAL STEEL COMPONENTS ARE FABRICATED IN AN AWS SHOP.
- ALL STRUCTURAL STEEL COMPONENTS ARE HOT DIPPED GALVANIZED TO ASTM A153-2016A STANDARDS.

MEMBRANE:
- UPON RECEIPT OF MATERIALS, MIL CERTS ARE CHECKED FOR CONFORMANCE WITH SPRUNG'S SPECIFICATIONS.
- AS MEMBRANE IS PATTERNED AND ASSEMBLED, A VISUAL CHECK OF THE MEMBRANE TAKES PLACE. FLAWED MATERIAL IS PUT ASIDE.
- COMPLETED MEMBRANE PANELS ARE VISUALLY CHECKED TO ENSURE DIMENSIONAL ACCURACY.

MATERIALS

ALUMINUM: ADM 2020
6351-T6, DESIGN & FABRICATION SHALL BE PER THE ALUMINUM DESIGN MANUAL.
MECHANICAL PROPERTIES:

TENSION
Fu ULTIMATE = 42 ksi Fy YIELD = 37 ksi ELONGATION = 8%

SHEAR
Fsu ULTIMATE = 25 ksi Fsy YIELD = 22 ksi

BEARING
Fb ULTIMATE = 84 ksi

MEMBRANE: ASCE-55-16

OUTER MEMBRANE - HERCULITE EXCEL 18
- FINISHED COATED WEIGHT 20 +/- 2 oz/yd^2
- TONGUE TEAR 175/155 lbf
- GRAB TENSILE 450/345 lbf
- STRIP TENSILE 1" 325/245 lbf/in
- ADHESION 10 lbf/in
- HYDROSTATIC RESISTANCE 600psi
- LOW TEMPERATURE 1/8" MANDREL, 4hr - PASS @ -40 DEGREES F

DAYLIGHT PANEL MEMBRANE - SEAMAN SHELTER-RITE 8324
- FINISHED COATED WEIGHT 24 +/- 2 oz/yd^2
- TONGUE TEAR 140/130 lbf
- GRAB TENSILE 400/350lbf
- STRIP TENSILE 1" 300/240 lbf/in
- ADHESION 10 lbf/in
- HYDROSTATIC RESISTANCE 500psi
- LOW TEMPERATURE 1/8" MANDREL, 4hr - PASS @ -40 DEGREES F

INNER LINER - HERCULITE EXCEL 14
- FINISHED COATED WEIGHT 14 +/- 2 oz/yd^2
- TONGUE TEAR 120/155 lbf
- GRAB TENSILE 230/215 lbf
- STRIP TENSILE 1" 170/140lbf/in
- ADHESION 12 lbf/in
- HYDROSTATIC RESISTANCE 380psi
- LOW TEMPERATURE 1/8" MANDREL, 4hr - PASS @ -40 DEGREES F

STRUCTURE MEMBRANE MEETS:
- NFPA 701
- CALIFORNIA STATE FIRE MARSHALL
- ASTM-E-84 CLASS A

STEEL: AISC 360-16
- 44-ksi Fy STRENGTH (44W)

ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE HOT DIPPED GALVANIZED TO ASTM A153-09 STANDARDS. DESIGN AND FABRICATION OF STRUCTURAL STEEL SHALL BE IN CONFORMANCE WITH AISC 360-16 & ASTM A572-15 GRADE 42 COMPLIANT.

ALL WELDS AND WELDING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE "THE AMERICAN WELDING SOCIETY."

ALL WELDS SHALL BE MADE WITH E70XX ELECTRODES AND BY WELDERS CERTIFIED BY AWS STANDARDS WITHIN THE LAST 12 MONTHS.

STRUCTURAL BOLTS:
STRUCTURAL BOLTS, ZINC-DICHROMATE PLATE SAE GRADE 8. ALL STRUCTURAL BOLTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION; I.E., ALL PLIES SHALL BE BROUGHT INTO FIRM CONTACT WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN WITH A SPUD WRENCH.

CABLE BRACING: ASCE 19-16
- ALL CABLE BRACING 1/2" DIAMETER STEEL GALVANIZED AIRCRAFT CABLE C/W HOT DIPPED GALVANIZED HEAVY DUTY THIMBLE EYES. 6X19+ IWRC, 26,600 LBS MINIMUM BREAKING STRENGTH.
- 5/8" X 9" JAW/JAW TURNBUCKLES - HOT DIPPED GALVANIZED
- 5/8" SHACKLES - HOT DIPPED GALVANIZED

DISSIMILAR METALS:
AS PER THE ALUMINUM DESIGN MANUAL, ALUMINUM CAN BE COUPLED TO MAGNESIUM, ZINC, CADMIUM, AND PASSIVE STAINLESS STEEL WITHOUT THE THREAT OF GALVANIC CORROSION.

STRUCTURE ANCHORAGE (EARTH)

1. MR3 EARTH ANCHOR IN CONJUNCTION WITH 2 @ 3/4" DIA. X 5FT PINS PER COLUMN BASE.
2. SOIL CAPACITY FOR THE EARTH ANCHORING METHOD TO BE REVIEWED AND APPROVED BY A LOCAL ENGINEER.
3. EARTH ANCHORS TO BE PULLED AND LOCKED TO THE VALUES AS OUTLINED ON THE EARTH ANCHOR LAYOUT (BY SPRUNG). ACHIEVED VALUES ARE TO BE RECORDED ON THIS DRAWING AT TIME OF INSTALLATION.
4. EARTH ANCHORS MUST BE PROOF TESTED TO THE LOADS SPECIFIED ON EARTH THE ANCHOR LAYOUT (BY SPRUNG) WITH THE FORESIGHT LL-2 LOAD LOCKER OR AN ENGINEER APPROVED EQUIVALENT.
5. ATTACHMENT OF THE MR3 EARTH ANCHORS TO THE SPRUNG ARCHES TO BE MAINTAINED IN A TAUT CONDITION THROUGH OUT THE LIFE OF THE STRUCTURE.
6. MINIMUM EARTH ANCHOR DEPTH = 7'-0" OR DEEPER DEPENDING ON SOIL CONDITIONS AS DETERMINED BY LOCAL ENGINEER.

STRUCTURE ANCHORAGE (CONCRETE)

HILTI ADHESIVE AND MECHANICAL ANCHORS
THE APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. THE DESIGN INFORMATION LISTED IN THE RESEARCH REPORT AND TABLES ARE VALID FOR THE FASTENERS ONLY. CONNECTED MEMBERS SHALL BE CHECKED FOR THEIR CAPACITY (WHICH MAY GOVERN).
2. THE ANCHORS SHALL BE IDENTIFIED BY LABELS ON THE PACKAGING INDICATING THE MANUFACTURER'S NAME AND PRODUCT DESIGNATION.
3. DESIGN INFORMATION, EDGE DISTANCES, SPACING AND MINIMUM EMBEDMENT REQUIREMENTS SHALL BE PER TABLES IN ICC-ES REPORT NO. ESR-3187.
4. SPECIAL INSPECTION SHALL BE PROVIDED FOR ANCHOR INSTALLATIONS.
5. THE ANCHORS SHALL BE INSTALLED AS PER THE MANUFACTURER'S INSTRUCTIONS EXCEPT AS OTHERWISE STATED IN THIS REPORT. COPIES OF THE INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE AT EACH JOB SITE.
6. THE ADHESIVE ANCHORS AND POST INSTALLED REINFORCING BAR CONNECTORS SHALL NOT BE USED TO SUPPORT FIRE-RESISTIVE CONSTRUCTION, UNLESS IN COMPLIANCE WITH SECTION 5.12 OF ICC-ES ESR3187.
7. MINIMUM CONCRETE COVER PER ACI 318-19 SHALL BE FOLLOWED WHENEVER APPLICABLE.
8. ATTACHMENT TO MASONRY IS OUTSIDE THE SCOPE OF THIS APPROVAL.

STRUCTURAL OBSERVATION

(1) STRUCTURAL OBSERVATION MAY BE REQUIRED FOR THE STRUCTURAL SYSTEM. STRUCTURAL OBSERVATION IS THE VISUAL OBSERVATION AT THE CONSTRUCTION SITE OF THE ELEMENTS AND CONNECTIONS OF THE STRUCTURAL SYSTEM AT SIGNIFICANT CONSTRUCTION STAGES, AND THE COMPLETE STRUCTURE FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS. STRUCTURAL OBSERVATION DOES NOT WAIVE THE RESPONSIBILITY FOR THE INSPECTIONS REQUIRED OF THE BUILDING INSPECTOR OR THE DEPUTY INSPECTOR.

(2) THE OWNER SHALL EMPLOY A STATE REGISTERED (AS REQUIRED) CIVIL OR STRUCTURAL ENGINEER OR LICENSED ARCHITECT TO PERFORM THE STRUCTURAL OBSERVATION. LOCAL PLANNING DEPT MAY REQUIRE THE USE OF THE ENGINEER OR ARCHITECT, OR HIS/HER DESIGNEE RESPONSIBLE FOR THE STRUCTURAL DESIGN WHO ARE INDEPENDENT OF THE CONTRACTOR.

(3) THE STRUCTURAL OBSERVER SHALL PROVIDE EVIDENCE OF EMPLOYMENT BY THE OWNER OR THE OWNER'S REPRESENTATIVE. A LETTER FROM THE OWNER, THE OWNER'S REPRESENTATIVE, OR A COPY OF THE AGREEMENT FOR SERVICES SHALL BE SENT TO THE BUILDING INSPECTOR BEFORE THE FIRST SITE VISIT.

(4) THE OWNER OR OWNER'S REPRESENTATIVE SHALL COORDINATE AND CALL FOR A MEETING BETWEEN THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN, STRUCTURAL OBSERVER, CONTRACTOR, AFFECTED SUBCONTRACTORS AND DEPUTY INSPECTORS. THE PURPOSE OF THE MEETING SHALL BE TO IDENTIFY THE MAJOR STRUCTURAL ELEMENTS AND CONNECTIONS THAT AFFECT THE VERTICAL AND LATERAL LOAD SYSTEMS OF THE STRUCTURE AND TO REVIEW SCHEDULING OF THE REQUIRED OBSERVATIONS. A RECORD OF THE MEETING SHALL BE INCLUDED IN THE FIRST OBSERVATION REPORT SUBMITTED TO THE BUILDING INSPECTOR.

(5) THE STRUCTURAL OBSERVER SHALL PERFORM SITE VISITS AT THOSE STEPS IN THE PROGRESS OF THE WORK THAT ALLOW FOR CORRECTION OF DEFICIENCIES WITHOUT SUBSTANTIAL EFFORT OR UNCOVERING OF THE WORK INVOLVED. AT A MINIMUM, THE LISTED SIGNIFICANT CONSTRUCTION STAGES ON EITHER THE "STRUCTURAL OBSERVATION/SIGNIFICANT CONSTRUCTION STAGES" FORM OR THE "STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER" FORM I NI/FORM.08 (PART 2) REQUIRE A SITE VISIT AND AN OBSERVATION REPORT FROM THE STRUCTURAL OBSERVER.

(6) THE STRUCTURAL OBSERVER SHALL PREPARE A REPORT OF THE "STRUCTURAL OBSERVATION REPORT FORM" I NI/FORM.08 (PART 1) FOR EACH SIGNIFICANT STAGE OF CONSTRUCTION OBSERVED. THE ORIGINAL OF THE STRUCTURAL OBSERVATION REPORT SHALL BE SENT TO THE BUILDING INSPECTOR'S OFFICE AND SHALL BE SIGNED AND SEALED (WET STAMP) BY THE RESPONSIBLE STRUCTURAL OBSERVER. ONE COPY OF THE OBSERVATION REPORT SHALL BE ATTACHED TO THE APPROVED PLANS. THE COPY ATTACHED TO THE PLANS SHALL BE SIGNED AND SEALED (WET STAMP) BY THE RESPONSIBLE STRUCTURAL OBSERVER OR THEIR DESIGNEE. COPIES OF THE REPORT SHALL ALSO BE GIVEN TO THE OWNER, CONTRACTOR, AND DEPUTY INSPECTOR. ANY DEFICIENCY NOTED ON THE OBSERVATION REPORT WILL BECOME THE RESPONSIBILITY OF THE STRUCTURAL ENGINEER OR ARCHITECT OF RECORD TO VERIFY ITS COMPLETION BY THE STRUCTURAL OBSERVER.

(7) A FINAL OBSERVATION REPORT MUST BE SUBMITTED WHICH SHOWS THAT ALL OBSERVED DEFICIENCIES WERE RESOLVED AND STRUCTURAL SYSTEM GENERALLY CONFORMS WITH THE APPROVED PLANS AND SPECIFICATIONS. THE LOCAL PLANNING DEPT. MAY NOT ACCEPT THE STRUCTURAL WORK WITHOUT THE FINAL OBSERVATION REPORT AND THE CORRECTION OF SPECIFIC DEFICIENCIES NOTED DURING NORMAL BUILDING INSPECTION.

(8) THE STRUCTURAL OBSERVER SHALL PROVIDE THE ORIGINAL STAMPED AND SIGNED "STRUCTURAL OBSERVATION REPORT FORM" TO THE LOCAL PLANNING DEPARTMENT AND SAFETY BUILDING INSPECTOR.

(9) WHEN THERE IS A NEED TO REPLACE THE STRUCTURAL OBSERVER OF RECORD, THE OWNER SHALL:
A) NOTIFY THE BUILDING INSPECTOR IN WRITING BEFORE THE NEXT INSPECTION BY SUBMITTING COMPLETED "STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER" FORM.
B) CALL AN ADDITIONAL PRE-CONSTRUCTION MEETING, AND
C) FURNISH THE REPLACEMENT STRUCTURAL OBSERVER WITH A COPY OF ALL PREVIOUS OBSERVATION REPORTS.
D) THE NEW STRUCTURAL OBSERVER MUST BE DESIGNATED BY THE ENGINEER OR ARCHITECT OF RECORD.
THE REPLACEMENT STRUCTURAL OBSERVER SHALL APPROVE THE CORRECTION OF THE ORIGINAL OBSERVED DEFICIENCIES UNLESS OTHERWISE APPROVED BY PLAN CHECK SUPERVISION. THE POLICY OF THE DEPARTMENT SHALL BE TO CORRECT ANY PROPERLY NOTED DEFICIENCIES WITHOUT CONSIDERATION OF THEIR SOURCE.

(10) THE ENGINEER OR ARCHITECT OF RECORD SHALL DEVELOP ALL CHANGES RELATING TO THE STRUCTURAL SYSTEMS. THE BUILDING DEPARTMENT SHALL REVIEW AND APPROVE ALL CHANGES TO THE APPROVED PLANS AND SPECIFICATIONS.

STRUCTURAL OBSERVATION IS REQUIRED PER IBC SECTION 1704.6.1 FOR SEISMIC RESISTANCE.
IN THE DIRECTION PERPENDICULAR TO THE BUILDING RIDGE THE LATERAL FORCE RESISTING SYSTEM IS THE 3 PIN ARCHES. IN THE DIRECTION PARALLEL TO THE RIDGE THE LATERAL FORCE RESISTING SYSTEM IS THE HORIZONTAL SPREADERS AND THE THREE BAYS OF 5X6 ARCH, 5X6 COLUMNS AND 5/8" DIAMETER STEEL CROSS BRACING.

SPECIAL INSPECTION

SEE FOUNDATION ENGINEER'S DRAWINGS FOR ADDITIONAL SPECIAL INSPECTION REQUIREMENTS NOT STATED HERE.

THIS BUILDING INCORPORATES STRUCTURAL BOLTS AND POST-INSTALLED ANCHORS WHICH MAY REQUIRE SPECIAL INSPECTION UNDER THE BUILDING CODE. PER THE BUILDING CODE, SPECIAL INSPECTION IF REQUIRED, IS THE RESPONSIBILITY OF THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNERS AGENT.

STATEMENT OF SPECIAL INSPECTION

HIGH STRENGTH BOLTING TO A SNUG TIGHT CONDITION: PERIODIC

INSTALLATION OF ADHESIVE ANCHORS: PERIODIC SPECIAL INSPECTION IS REQUIRED AND SHALL CONFORM TO THE REQUIREMENTS OF ESR-3187, SECTION 4.4.

WELDED STEEL CONNECTIONS: SPECIAL INSPECTION IS NOT REQUIRED SINCE THESE COMPONENTS SHALL BE FABRICATED IN A CERTIFIED FABRICATION SHOP.

DRAWING INDEX

SHEET #	DRAWING #	DESCRIPTION
1	R24-TITLE.0	TITLE SHEET
2	R24-367.0	FLOOR PLAN & ELEVATIONS
3	R24-367.1	COLUMN BASE LAYOUT
4	R24-367.2	CONCRETE DETAILS
5	S-1	SECTION & BASE DETAILS
6	S-2	PURLIN & SPLICE DETAILS
7	S-3	CABLE BRACE DETAILS
8	S-4	CABLE BRACE DETAILS
9	S-5	FLAT END DETAILS
10	S-6	MEMBRANE, FLAT END, & CONN. DETAILS
11	S-7	CONNECTOR CORRIDOR DETAILS

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06/26/2025
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MEAD & HUNT INC.

55' - 0"x 51' - 0"
SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION

TITLE SHEET

DATE: 06/25/2025
DRAWN BY: --

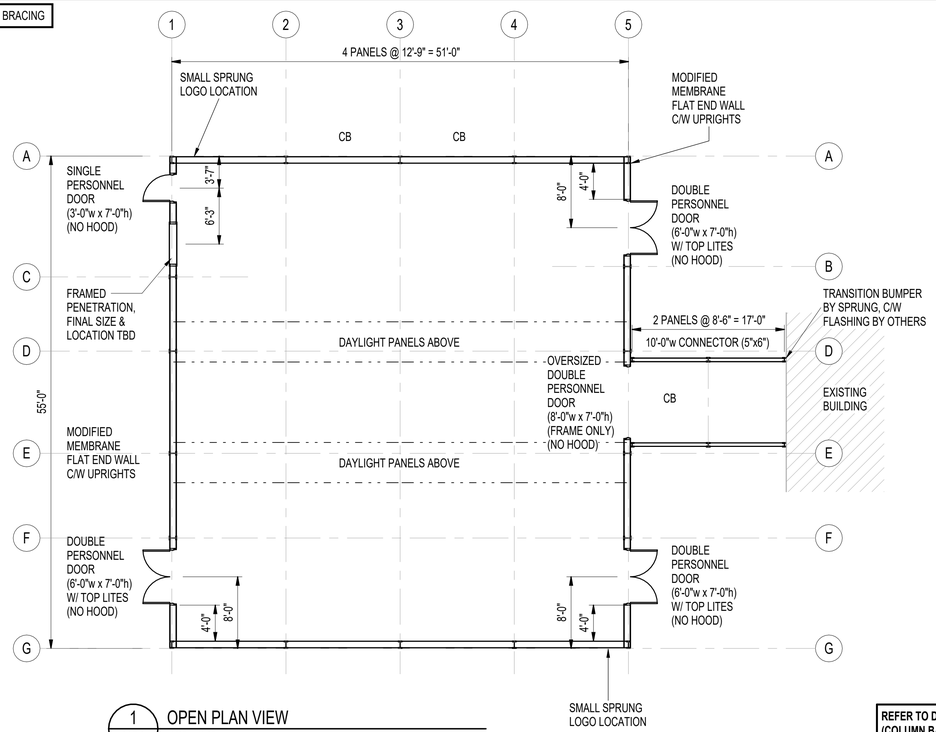
R24-TITLE.0

SPRUNG WO #28303

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I:\Projects\Engineering\2025\Mead & Hunt - Oppso County (55x51 ins Conc Connector)\Mead & Hunt - Titlesheet.rvt
6/26/2025 4:28:20 PM

CB = CABLE BRACING



1 367.0 OPEN PLAN VIEW 1/8" = 1'-0"

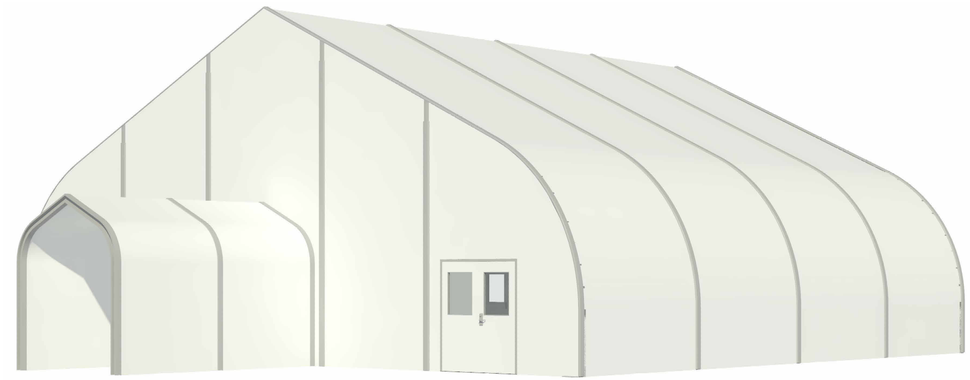
ACCESSORIES

CATEGORY	TYPE	SIZE	COMMENT	COUNT
LIGHTING	HOOD LIGHT		LED	2
LIGHTING	POLE MOUNT		LED	1

PERSONNEL DOORS

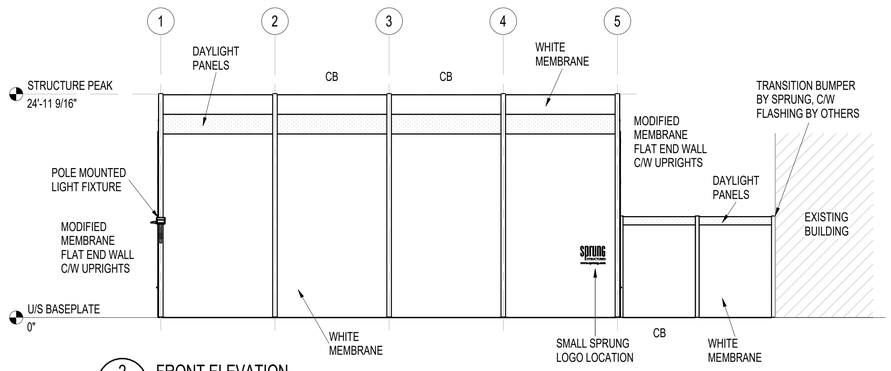
CATEGORY	TYPE	HOOD WIDTH	BEAM	DOOR SIZE	COMMENT	SWING	COUNT
FLAT END	DPD			6'-0"w x 7'-0"h	TOP LITES	STANDARD	3
FLAT END	ODPD			8'-0"w x 7'-0"h	FRAME ONLY		1
FLAT END	SPD			3'-0"w x 7'-0"h		STANDARD	1

REFER TO DWG R24-367.1 (COLUMN BASE LAYOUT) FOR CONCRETE PAD DIMENSIONS



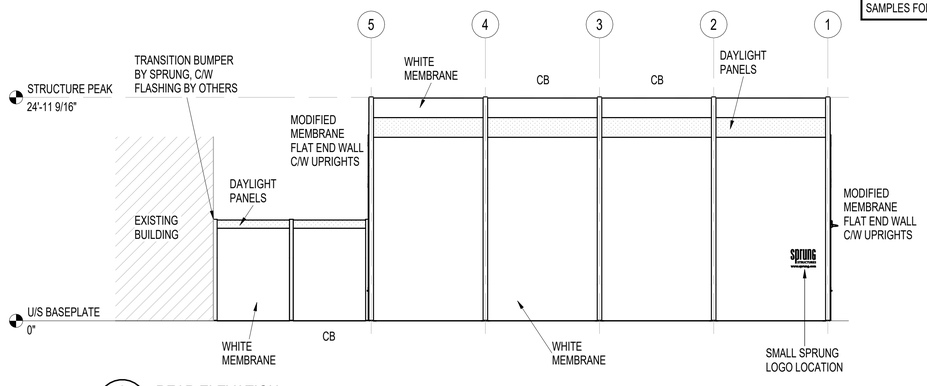
4 367.0 EXTERIOR VIEW RENDER

REFER TO GENERAL NOTES ON TITLESHEET FOR SPECIAL INSPECTION & ADDITIONAL MATERIAL NOTES.

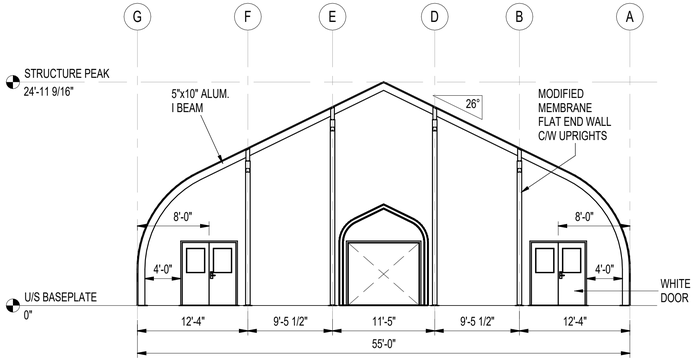


2 367.0 FRONT ELEVATION 1/8" = 1'-0"

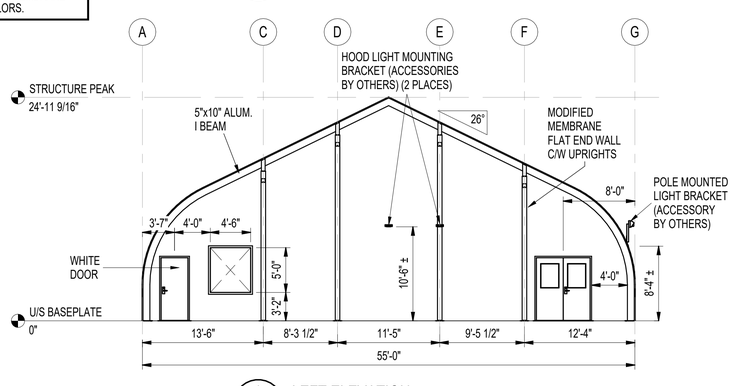
COLORS ON THESE ELEVATIONS MAY VARY SIGNIFICANTLY DEPENDING ON PRINTER OR MONITOR. PLEASE REFER TO MEMBRANE SAMPLES FOR ACTUAL COLORS.



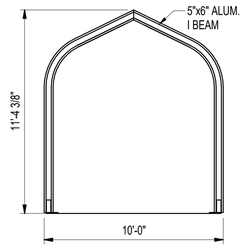
3 367.0 REAR ELEVATION 1/8" = 1'-0"



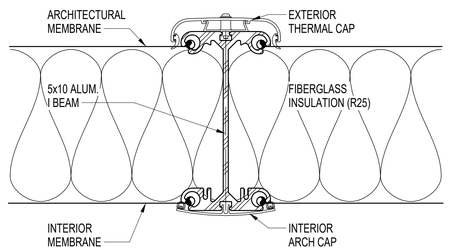
5 367.0 RIGHT ELEVATION 1/8" = 1'-0"



6 367.0 LEFT ELEVATION 1/8" = 1'-0"



7 367.0 SECTION 10'-0" CONNECTOR (5x6) 1/4" = 1'-0"



8 367.0 5x10 INSULATED BEAM SECTION 3" = 1'-0"

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GENERAL NOTES:

1. ALL PERSONNEL DOORS C/W PANIC HARDWARE & HOODS, AS NOTED.
2. STRUCTURE TO BE INSULATED WITH FIBERGLASS BATT INSULATION C/W INNER LINER, TO DAYLIGHT PANEL LEVEL ONLY.
3. INNER & OUTER MEMBRANE TO BE FINISHED TO CONCRETE USING ALUM. FLAT BAR.
4. STRUCTURE MEMBRANE MEETS: NFPA 701, CALIFORNIA STATE FIRE MARSHAL, ASTM E84, CAN/ULC-S-109 & CAN/ULC-S-102 SPECIFICATIONS.
5. THIS STRUCTURE IS DESIGNED TO SHED/RELEASE SNOW. THE PERIMETER OF THE STRUCTURE SHALL BE KEPT CLEAR.
6. WHEN DESIGNING A HEATING, VENTILATION OR AIR CONDITIONING SYSTEM FOR ANY TYPE OF BUILDING, IT IS IMPORTANT TO ENSURE THAT THIS SYSTEM INTAKES MORE AIR THAN IS BEING EXHAUSTED AT ANY GIVEN TIME. THIS PROCESS WILL RESULT IN A POSITIVE PRESSURE BEING MAINTAINED. CONVERSELY, IF NEGATIVE PRESSURE EXISTS WITHIN THE STRUCTURE, IT WILL BE DIFFICULT TO OPEN DOORS AND MOISTURE WILL BE DRAWN INTO THE STRUCTURE.
7. ALL INTERIOR WALLS & PARTITIONS (IF APPLICABLE) TO BE FREE STANDING & INDEPENDENT OF SPRUNG STRUCTURE.



06/26/2025

canyons
STRUCTURAL CONSULTING

1245 E. BRICKYARD ROAD, SUITE 200
SALT LAKE CITY, UTAH
PH. (801) 486.6848
info@canyonsstructural.com
www.canyonsstructural.com

DESIGN LOADS

LOCATION:	SAN LUIS OBISPO, CA
BUILDING CODE:	CBC 2022
WIND SPEED:	99 MPH 3 SEC GUST
RISK CATEGORY: III	EXPOSURE: C
GROUND SNOW LOAD:	0 PSF
(SEE SNOW SHED REPORT)	

MEAD & HUNT INC.
55' - 0"x 51' - 0"
SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
2	04/26/24	DH	REVISE BAY SPACING
3	05/22/24	DH	ADD EXTERIOR LIGHTS
4			
5			
6			
7			
8			
9			

FLOOR PLAN & ELEVATIONS

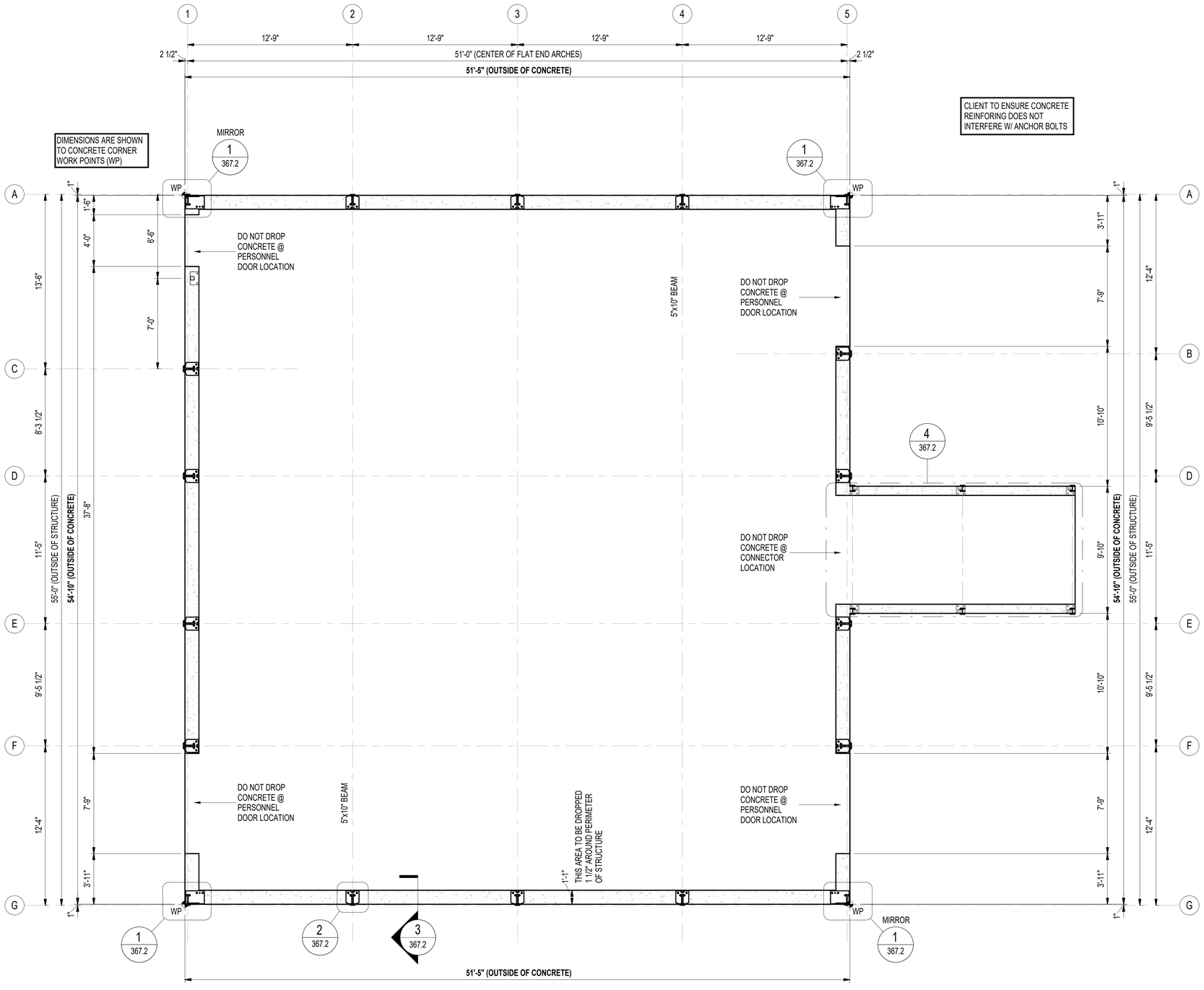
DATE: 03/20/2024 DRAWN BY: P. DUMONT

R24-367.0

SPRUNG WO #28303

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1:\2024 Drawings\Full Size\R24-300\R24-367-R3.rvt
3/20/2024 2:19:07 PM



1 367.1 COLUMN BASE LAYOUT
1/4" = 1'-0"

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(403) 601-2292 www.sprung.com

CONCRETE GENERAL NOTES:

1. MIN. 4000psi (27.5 MPa) CONCRETE.
2. OUTER MEMBRANE TO BE FINISHED TO CONCRETE USING ALUM. FLAT BAR
3. EXPOSED CONCRETE TO BE FINISHED ACCORDINGLY.
4. CLIENT TO ENSURE CONCRETE REINFORCING DOES NOT INTERFERE WITH ANCHOR BOLTS.
5. THIS DRAWING AND THE ASSOCIATED DETAILS ARE NOT A FOUNDATION DESIGN. THIS DRAWING IS PROVIDED AS A SERVICE TO THE OWNER AND THE OWNER'S FOUNDATION ENGINEER TO SHOW CONCRETE LIMITS AND DETAILS REQUIRED FOR THE ERECTION AND INSTALLATION OF THE SPRUNG STRUCTURE.
6. REFER TO DESIGN NOTES FOR ASSUMPTIONS USED IN THE DESIGN OF THE POST-INSTALLED ANCHORS.
7. ASSUMPTIONS USED IN THE DESIGN OF THE POST-INSTALLED ANCHORS DO NOT CONTROL OVER THE DESIGN BY THE FOUNDATION ENGINEER. IT IS CONTINGENT ON THE FOUNDATION ENGINEER TO DESIGN FOR DEVELOPMENT OF THE POST-INSTALLED ANCHORS TO CONFORM TO THE BUILDING CODE AND THE REQUIREMENTS OF THE SPRUNG STRUCTURE DESIGN.

REGISTERED PROFESSIONAL ENGINEER
CAMBRIA M. FLORES
No. C-93091
Exp. 6/30/2025
06/26/2025
CIVIL
STATE OF CALIFORNIA

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MEAD & HUNT INC.
55' - 0"x 51' - 0"
SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
2	04/26/24	DH	REVISE BAY SPACING
3	05/22/24	DH	ADD EXTERIOR LIGHTS
4			
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9			

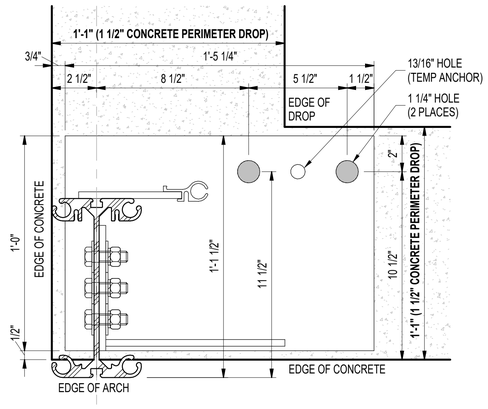
COLUMN BASE LAYOUT

DATE: 06/17/2025
DRAWN BY: P. DUMONT

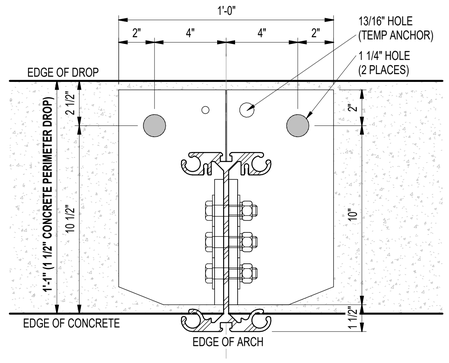
R24-367.1

SPRUNG WO #28303

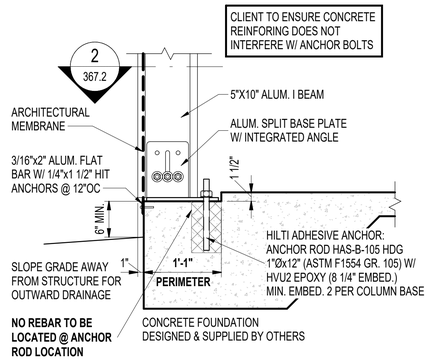
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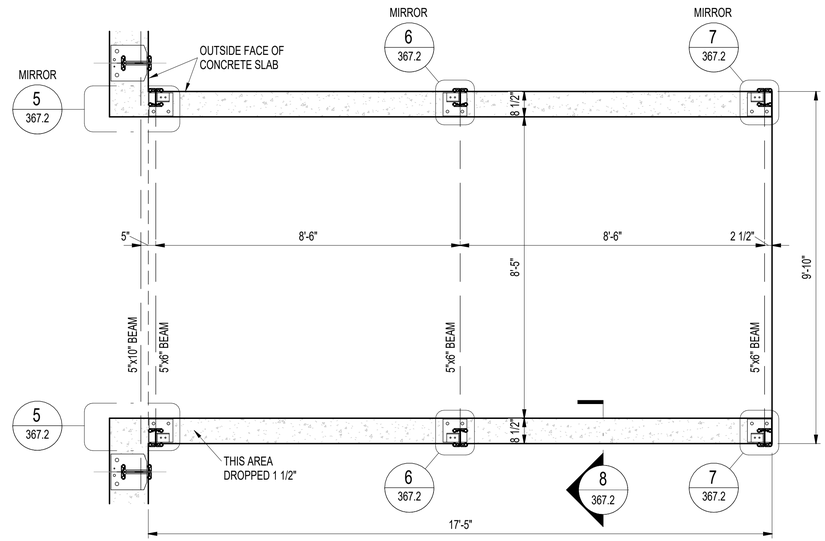
1 367.2 5"x10" CORNER BASE PLATE INS CONC - PLAN
3" = 1'-0"



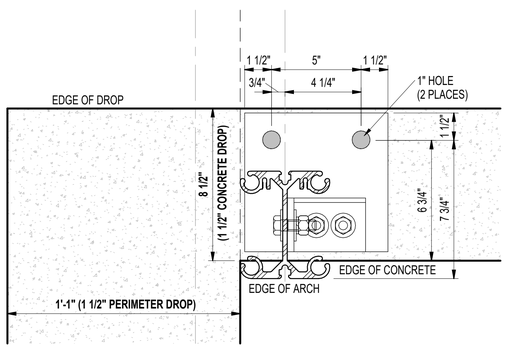
2 367.2 5"x10" BASE PLATE CONC - PLAN
3" = 1'-0" TYPICAL ARCH & UPRIGHT



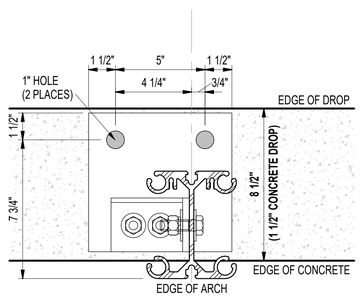
3 367.2 5"x10" BASE PLATE CONC - SECTION
1" = 1'-0" TYPICAL



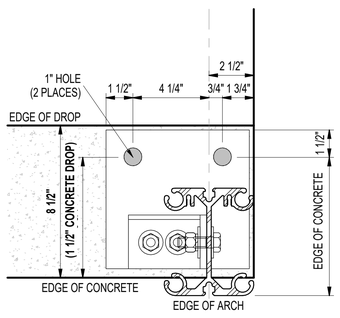
4 367.2 10'-0" VESTIBULE (5"x6") BUMPOUT - PLAN
1/2" = 1'-0"



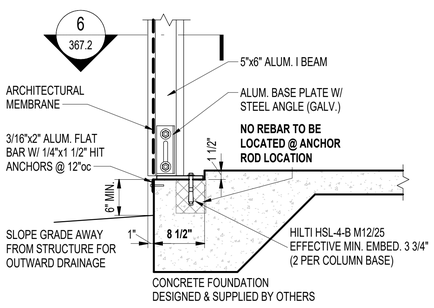
5 367.2 5"x6" BASE PLATE CONC - PLAN (FLAT END)
3" = 1'-0"



6 367.2 5"x6" BASE PLATE CONC - PLAN
3" = 1'-0"



7 367.2 5"x6" BASE PLATE CONC - PLAN (CORNER)
3" = 1'-0"



8 367.2 5"x6" BASE PLATE CONC - SECTION
1" = 1'-0"

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MEAD & HUNT INC.
55' - 0"x 51' - 0"

SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
2	04/26/24	DH	REVISE BAY SPACING
3	05/22/24	DH	ADD EXTERIOR LIGHTS
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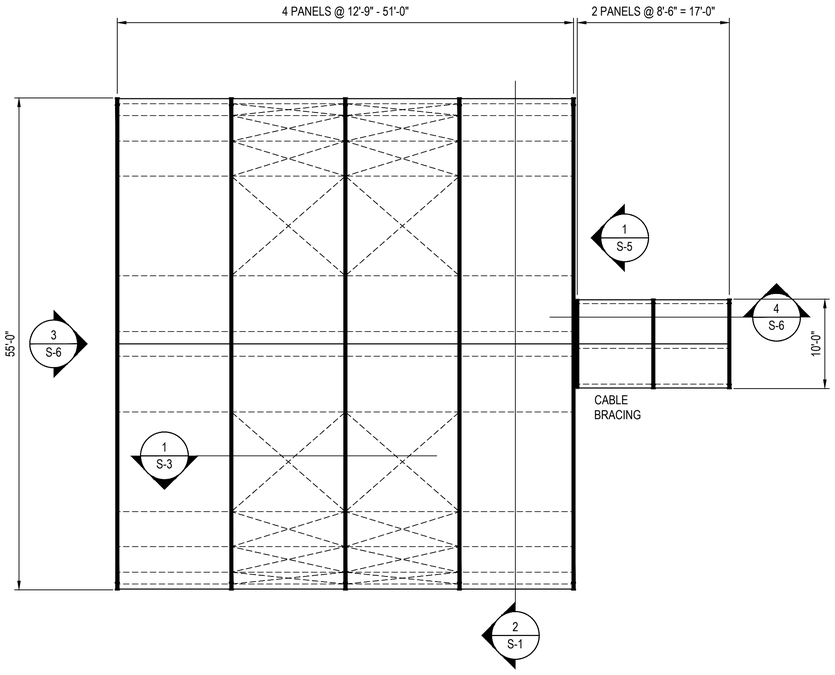
CONCRETE DETAILS

DATE: 03/20/2024
DRAWN BY: P. DUMONT

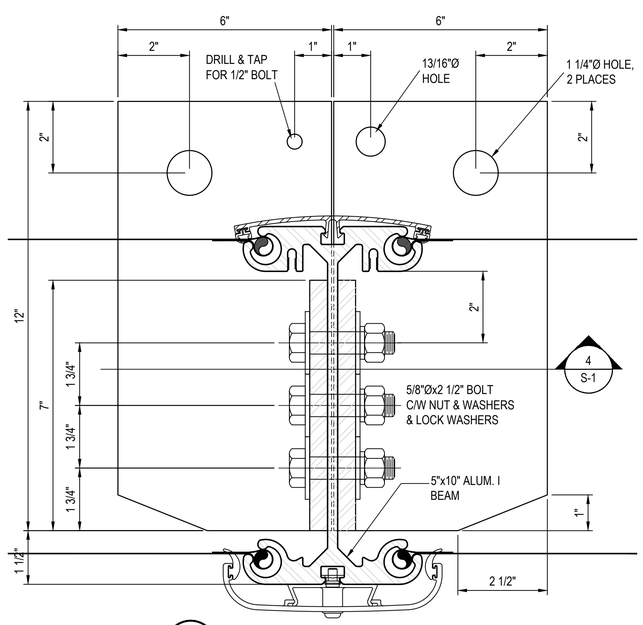
R24-367.2

SPRUNG WO #28303

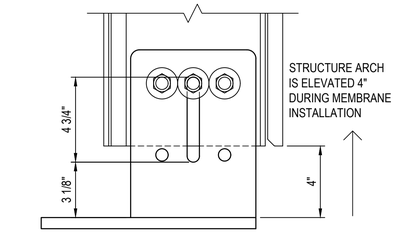
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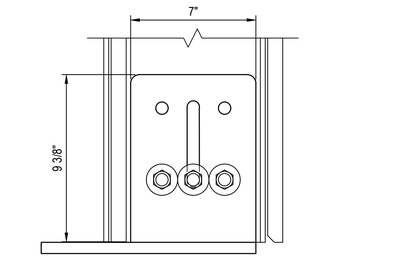
1 S-1 PLAN VIEW
1/8"=1'-0"



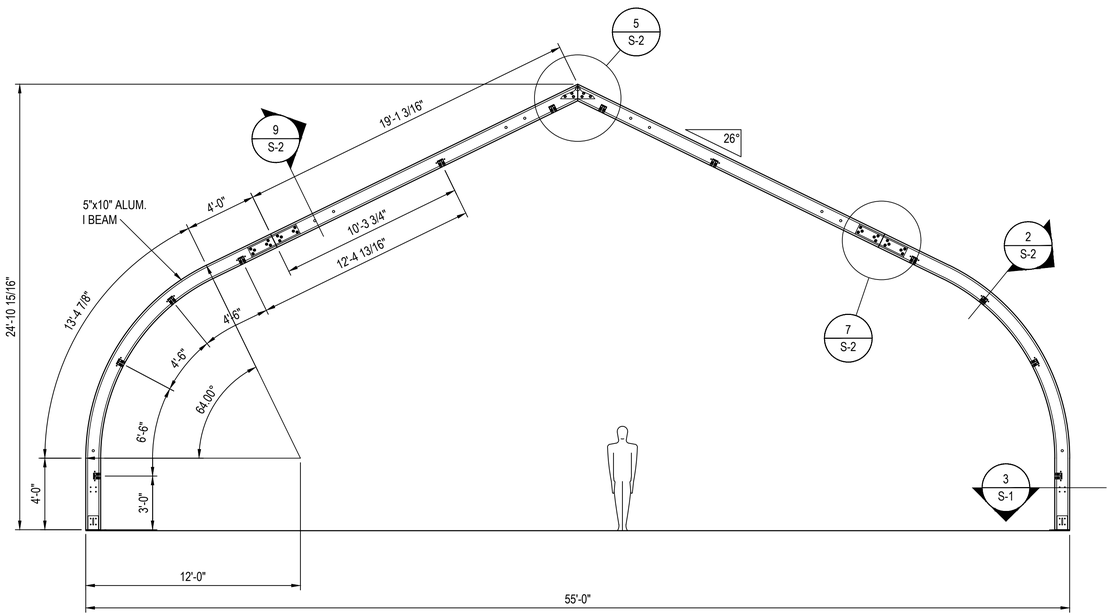
3 S-1 5"x10" BEAM BASE PLATE - PLAN
6"=1'-0"



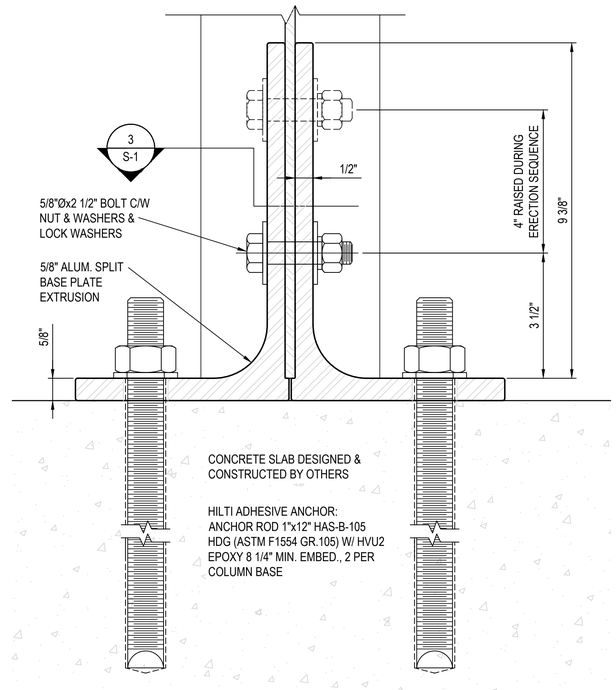
5 S-1 5"x10" BEAM BASE PLATE - ELEVATION
3"=1'-0" (ERECTION CONDITION)



6 S-1 5"x10" BEAM BASE PLATE - ELEVATION
3"=1'-0" (FINAL CONDITION)



2 S-1 SECTION 55'-0" INSULATED STRUCTURE
1/4"=1'-0"



4 S-1 5"x10" BEAM BASE PLATE - SECTION
6"=1'-0"

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BUILDING MATERIALS:

STRUCTURAL BOLTS:
ALL STRUCTURAL BOLTS SHALL BE SAE GRADE 8 ZINC-DICHROMATE PLATED, WITH Fu=113 ksi. BOLTS ARE ASTM A325 COMPLIANT. ALL STRUCTURAL BOLTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION; I.E., ALL PLIES SHALL BE BROUGHT INTO FIRM CONTACT WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A MAN WITH A SPUD WRENCH.

ANCHOR BOLTS:
ANCHOR BOLTS SHALL NOT BE CAST-IN-PLACE. THE DEVELOPMENT OF THE POST-INSTALLED ANCHORS INTO THE CONCRETE FOUNDATION IS THE RESPONSIBILITY OF THE OWNER OR THE OWNER'S REGISTERED FOUNDATION ENGINEER.

ALUMINUM: 6351-T6, DESIGN AND FABRICATION SHALL BE PER THE ALUMINUM DESIGN MANUAL.

STEEL: 300W CSA, G40.21, FY=44 KSI, ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE HOT DIP GALVANIZED. DESIGN AND FABRICATION OF STRUCTURAL STEEL SHALL BE IN CONFORMANCE WITH AISC 360-16 & ASTM A572 GRADE 42 COMPLIANT.

STEEL WIRE ROPE: 6X19= IWRC, 26,600 LBS MINIMUM BREAKING STRENGTH.

SPECIAL INSPECTION:
THIS BUILDING INCORPORATES STRUCTURAL BOLTS AND POST-INSTALLED ANCHORS WHICH MAY REQUIRE SPECIAL INSPECTION UNDER THE BUILDING CODE. PER THE BUILDING CODE, SPECIAL INSPECTION, IF REQUIRED, IS THE RESPONSIBILITY OF THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT.

CONCRETE: 4000psi OR GREATER

REGISTERED PROFESSIONAL ENGINEER
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No. C-64891
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06/26/2025
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MEAD & HUNT INC.

SAN LUIS OBISPO AIRPORT
55'-0" x 51'-0"
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
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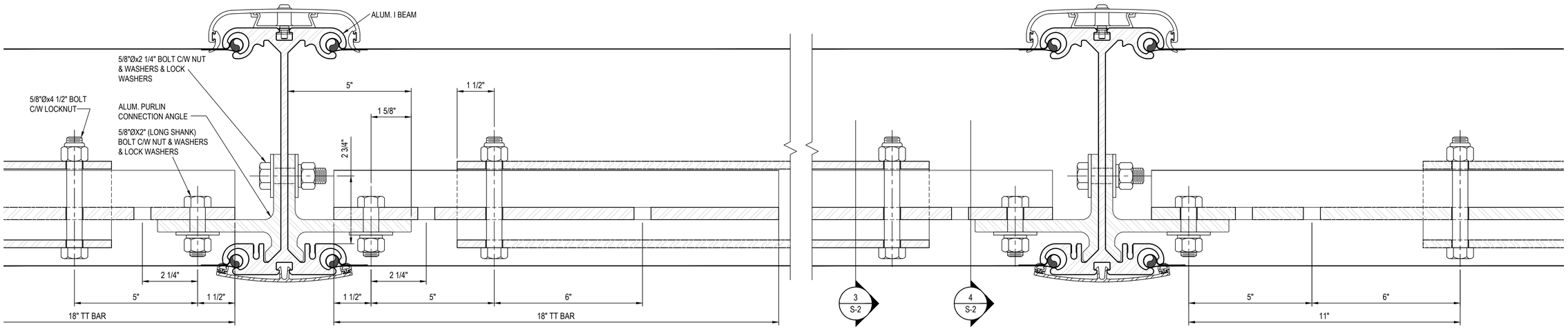
SECTION & BASE DETAILS

DATE: 06/25/2025
DRAWN BY: D. BENNETT

S-1

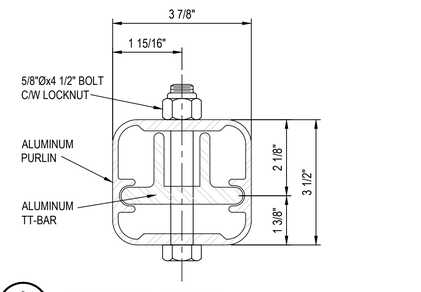
SPRUNG WO# 28303

PROJECTS\FOOTHILL\PACKAGE\BASE.RVT - DISPLACEMENT_ZOOM_RIGHT.JPG - 6/26/2025 4:47:21 PM

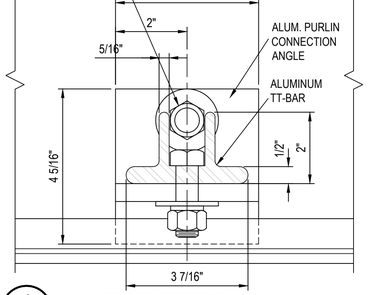


1 S-2 — 5"x10" PURLIN - ELEVATION
6"=1'-0" (ERECTION CONDITION)

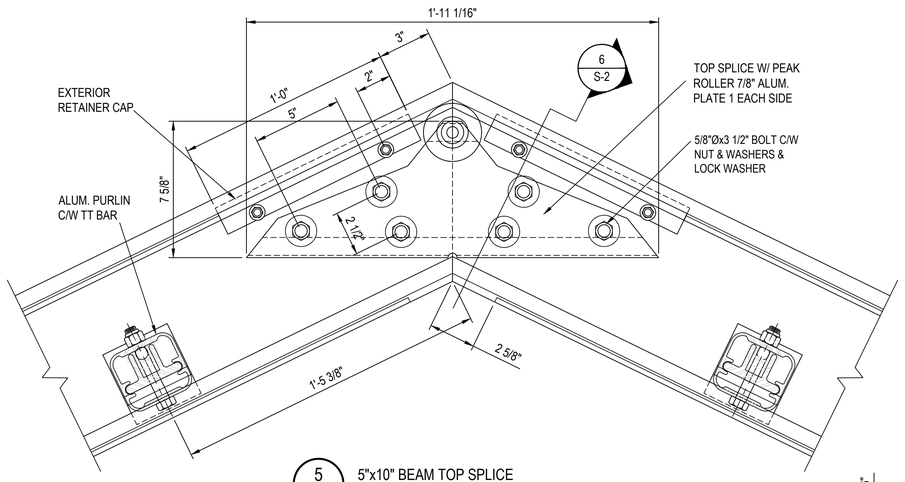
2 S-2 — 5"x10" PURLIN - ELEVATION
6"=1'-0" (FINAL CONDITION)



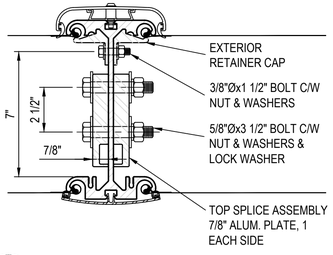
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6"=1'-0"



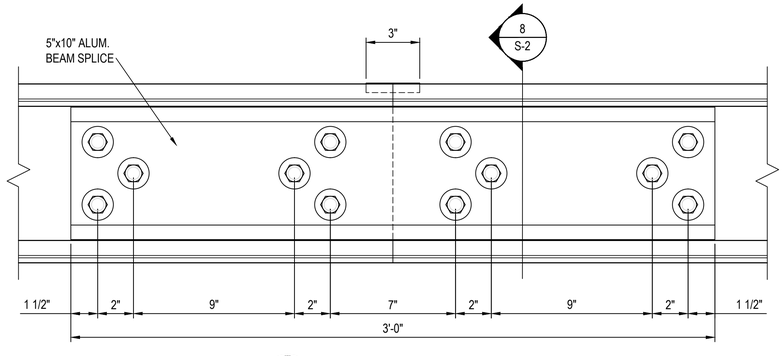
4 S-2 — 5"x10" TT-BAR - SECTION
6"=1'-0"



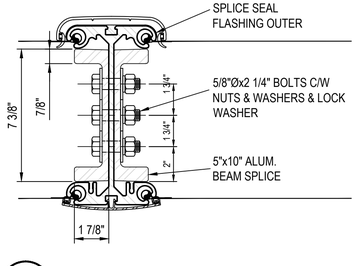
5 S-2 — 5"x10" BEAM TOP SPLICE
3"=1'-0"



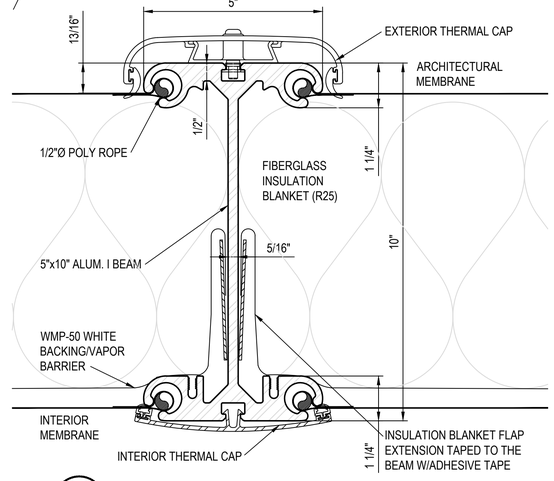
6 S-2 — 5"x10" TOP SPLICE - SECTION
3"=1'-0"



7 S-2 — 5"x10" BEAM SPLICE
3"=1'-0"



8 S-2 — 5"x10" BEAM SPLICE - SECTION
3"=1'-0"



9 S-2 — 5"x10" INSULATED BEAM SECTION
6"=1'-0"

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Civil C-93091
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MEAD & HUNT INC.

55'-0" x 51'-0"
SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
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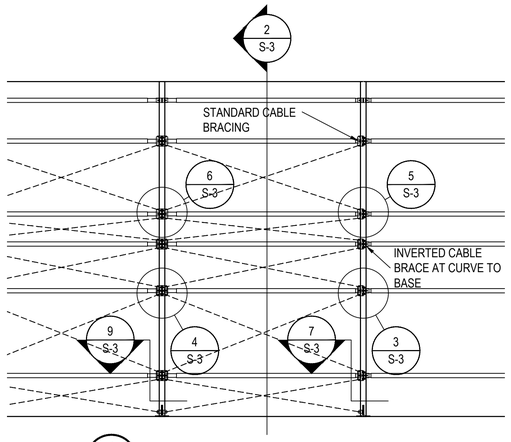
PURLIN & SPLICE DETAILS

DATE: 06/25/2025 | DRAWN BY: D. BENNETT

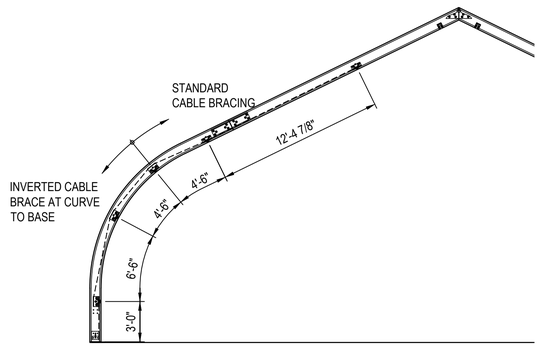
S-2

SPRUNG WO# 28303

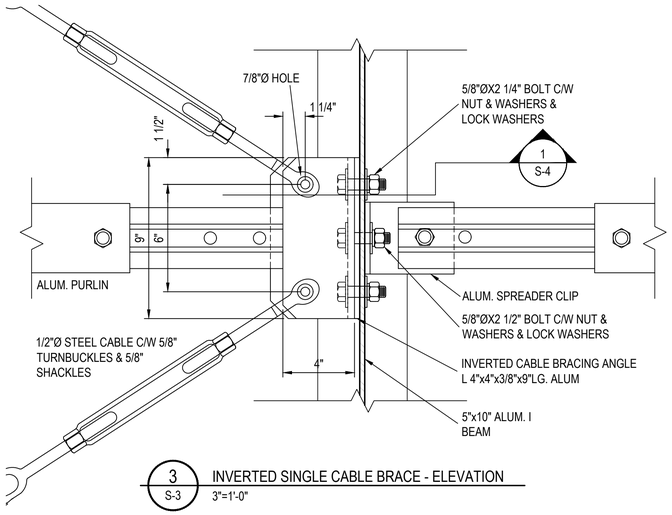
PROJECTS\SPRUNG PROJECTS\MEAD & HUNT - SAN LUIS OBISPO AIRPORT\SHOP DRAWINGS\S-2 DETAILS.DWG
6/26/2025 4:51:21 PM



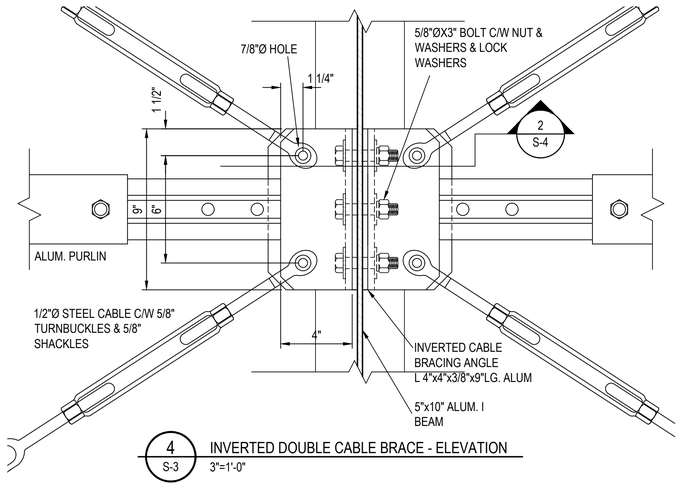
1 S-3 — 60'-0" PARTIAL CABLE BRACING - ELEVATION
3/16"=1'-0"



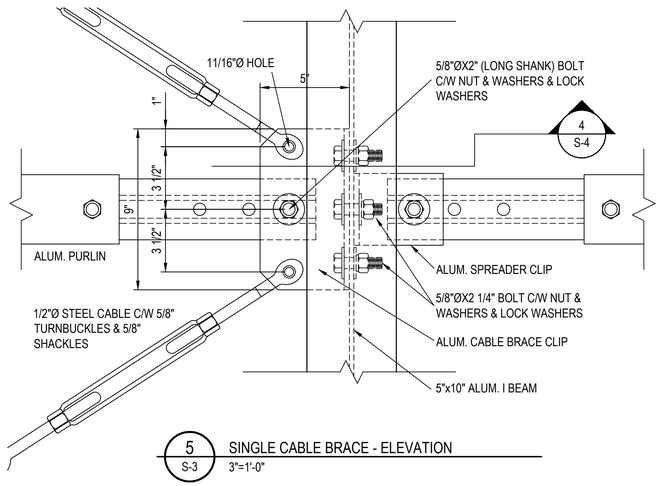
2 S-3 — 55'-0" PARTIAL CABLE BRACING - SECTION
3/16"=1'-0"



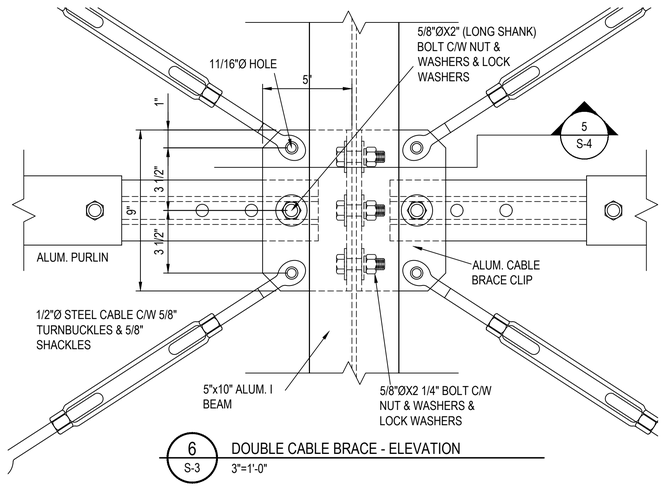
3 S-3 — INVERTED SINGLE CABLE BRACE - ELEVATION
3"=1'-0"



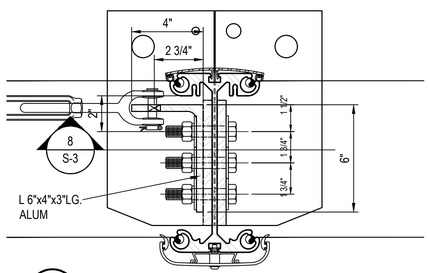
4 S-3 — INVERTED DOUBLE CABLE BRACE - ELEVATION
3"=1'-0"



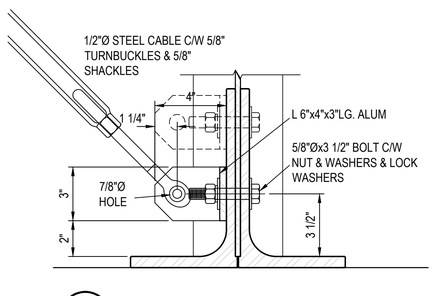
5 S-3 — SINGLE CABLE BRACE - ELEVATION
3"=1'-0"



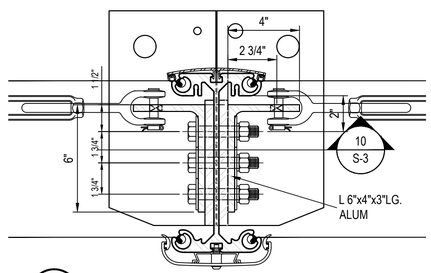
6 S-3 — DOUBLE CABLE BRACE - ELEVATION
3"=1'-0"



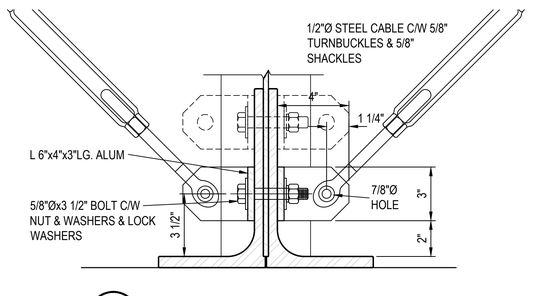
7 S-3 — 5"x10" CABLE PLATE - PLAN
3"=1'-0"



8 S-3 — 5"x10" CABLE PLATE - ELEVATION
3"=1'-0"



9 S-3 — 5"x10" DOUBLE CABLE PLATE - PLAN
3"=1'-0"



10 S-3 — 5"x10" DOUBLE CABLE PLATE - ELEVATION
3"=1'-0"

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www.canyonsstructural.com

MEAD & HUNT INC.

55'-0" x 51'-0"

SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

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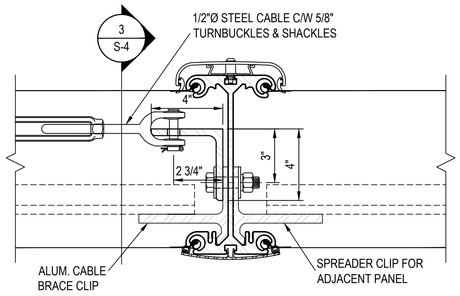
CABLE BRACE DETAILS

DATE: 06/25/2025
DRAWN BY: D. BENNETT

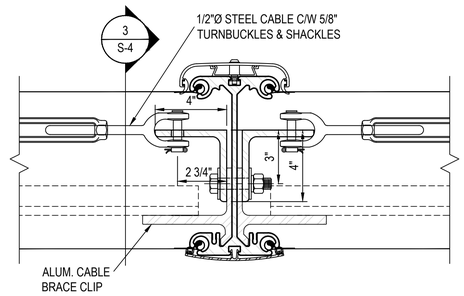
S-3

SPRUNG WO# 28303

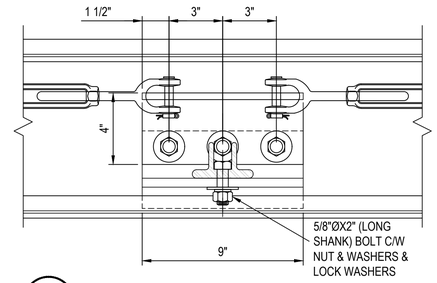
PROJECTS\SPRUNG\SIGNATURE\SAN LUIS OBISPO COUNTY\2025\SET\SLO_COVER.DWG 6/26/2025 1:01:21 PM



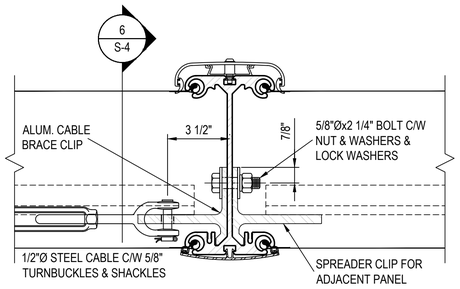
1 S-4 INVERTED CABLE BRACE SECTION
3"=1'-0"



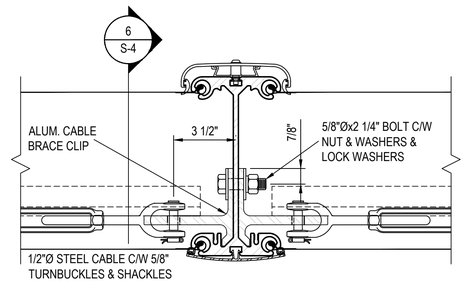
2 S-4 INVERTED DOUBLE CABLE BRACE SECTION
3"=1'-0"



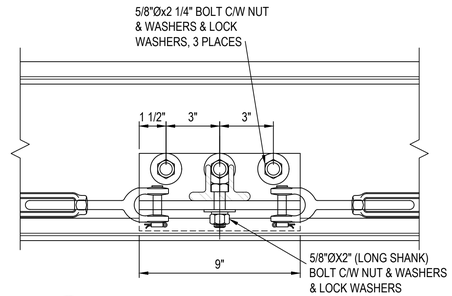
3 S-4 INVERTED CABLE BRACE BRACKET ELEVATION
3"=1'-0"



4 S-4 SINGLE CABLE BRACE SECTION
3"=1'-0"



5 S-4 DOUBLE CABLE BRACE SECTION
3"=1'-0"



6 S-4 CABLE BRACE BRACKET ELEVATION
3"=1'-0"

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MEAD & HUNT INC.

55'-0" x 51'-0"

SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
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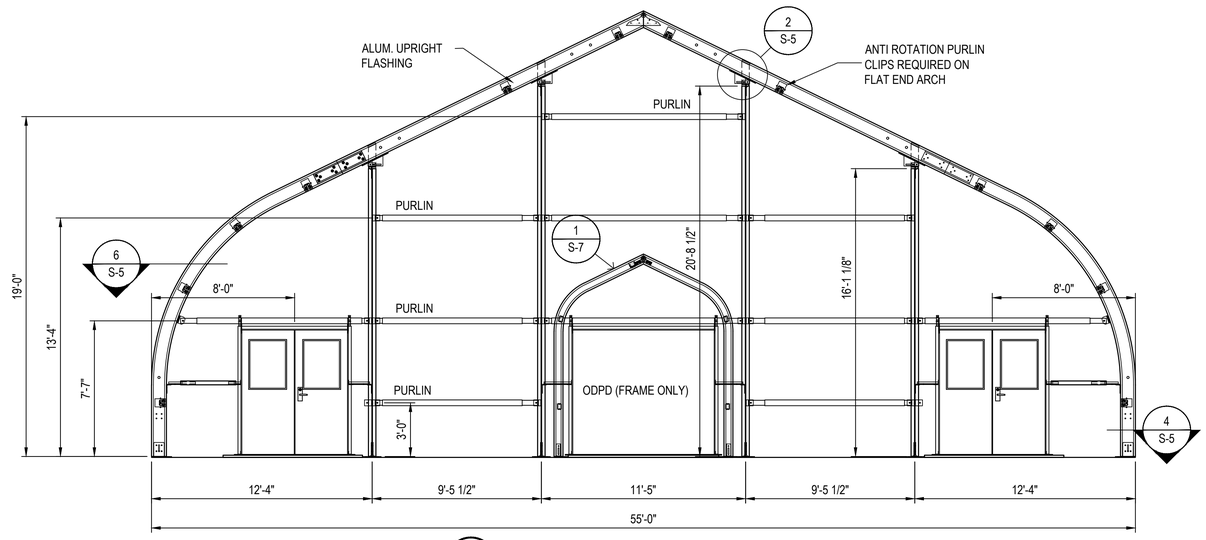
CABLE BRACE DETAILS

DATE: 06/25/2025
DRAWN BY: D. BENNETT

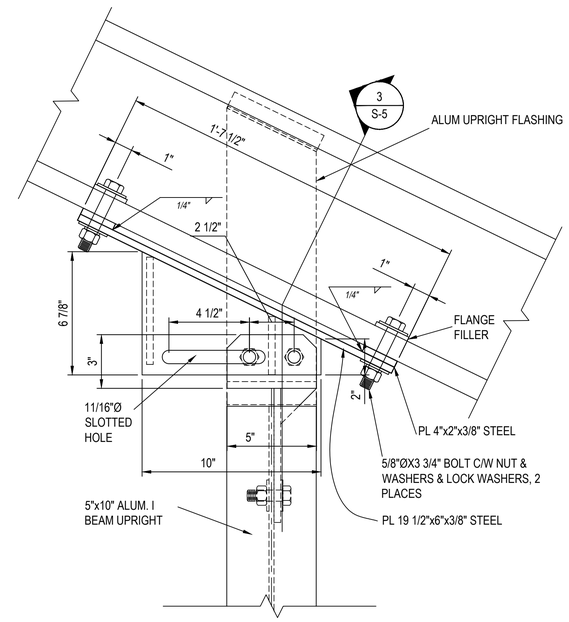
S-4

SPRUNG WO# 28303

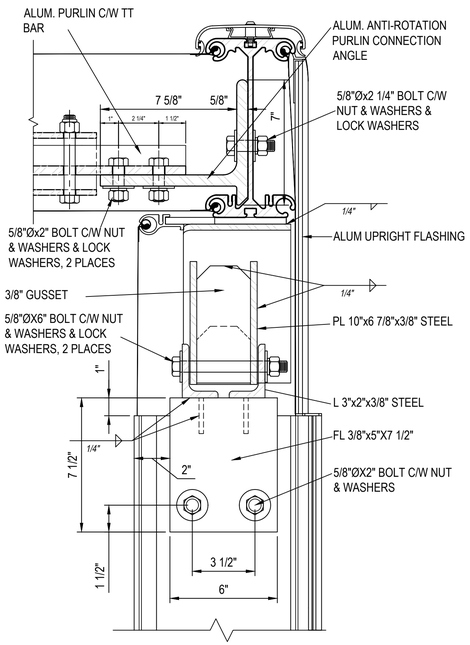
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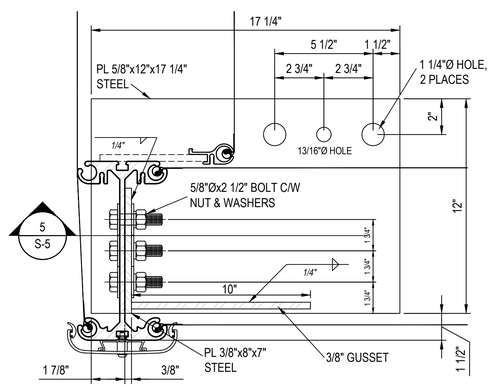
1 S-5 RIGHT FLAT END 55'-0" INSULATED STRUCTURE
1/4"=1'-0"



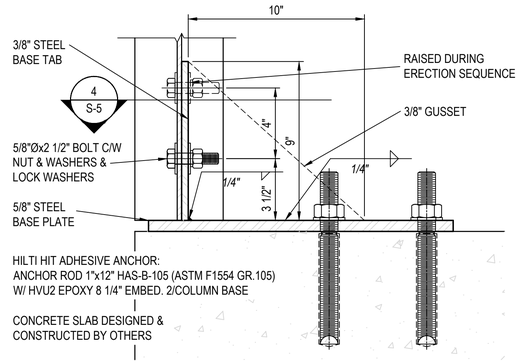
2 S-5 FLAT END UPRIGHT BRACKET - ELEV.
3"=1'-0"



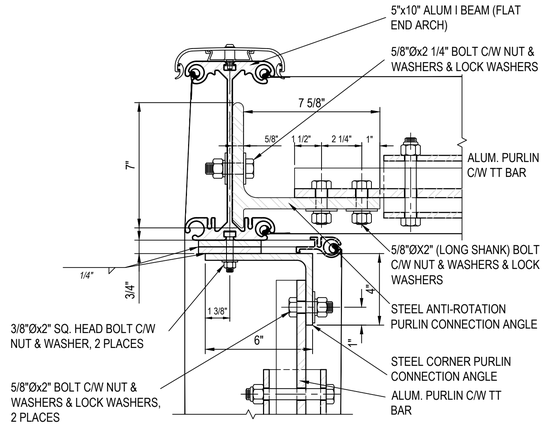
3 S-5 FLAT END UPRIGHT BRACKET - SECTION
3"=1'-0"



4 S-5 5"x10" INS. CORNER BASE PLATE - PLAN
3"=1'-0"



5 S-5 5"x10" CORNER BASE PLATE - SECTION
3"=1'-0"



6 S-5 5"x10" INS CORNER PURLIN CONNECTION
3"=1'-0"

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MEAD & HUNT INC.

55'-0" x 51'-0"

SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

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FLAT END DETAILS

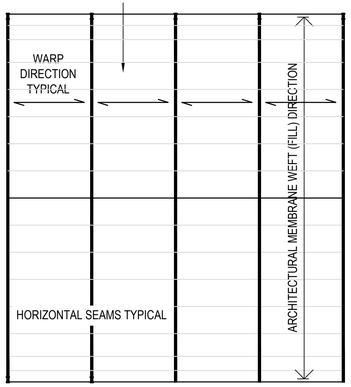
DATE: 06/25/2025
DRAWN BY: D. BENNETT

S-5

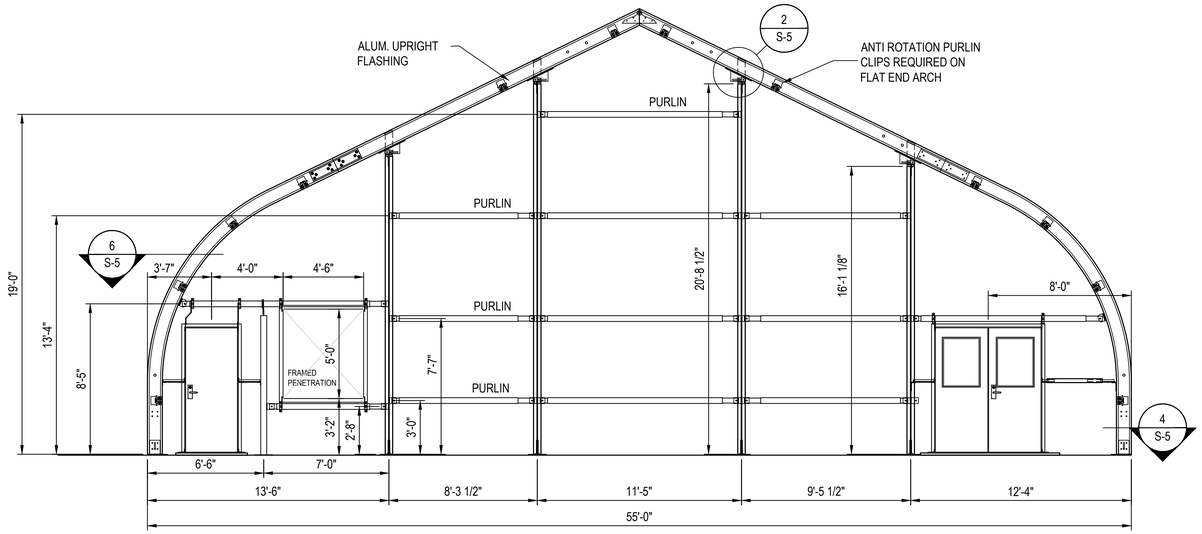
SPRUNG WO# 28303

SIGNATURE SERIES

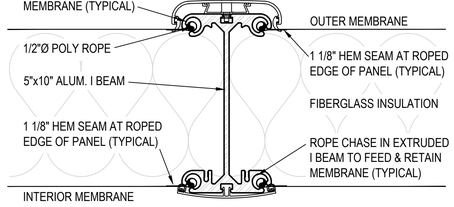
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1 S-6 MEMBRANE LAYOUT
3/32"=1'-0"



3 S-6 LEFT FLAT END 55'-0" INSULATED STRUCTURE
1/4"=1'-0"



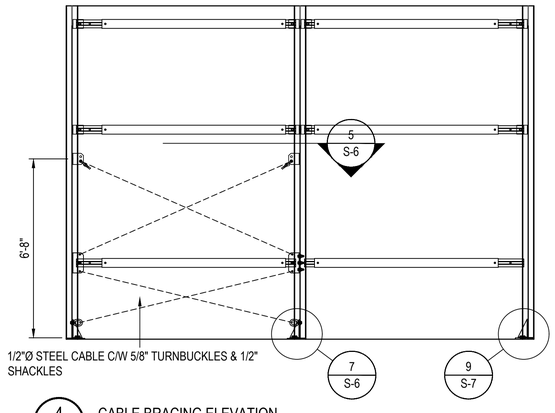
2 S-6 5"x10" BEAM SECTION - MEMBRANE
3"=1'-0"

NOTES:

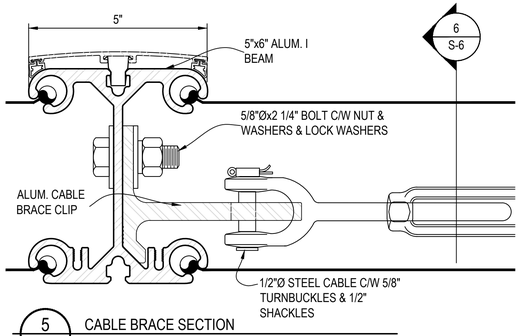
OUTER MEMBRANE & DAYLIGHT PANELS:
HERCULITE EXCEL 18 C/W POLYURETHANE TOP COAT
1.MEMBRANE STRENGTH:
WARP = 325 pli
FILL (WEFT) = 245 pli
2. PRESTRESS (COMPENSATION)
WARP = 1.1%
FILL (WEFT) = 0.5%
3. MEMBRANE - PVC COATED POLYESTER SCRIM

INNER MEMBRANE/LINER:
HERCULITE EXCEL 14 C/W POLYURETHANE TOP COAT
1. MEMBRANE STRENGTH:
WARP = 170 pli
FILL (WEFT) = 140 pli
2. PRESTRESS (COMPENSATION)
WARP = 1.0%
FILL (WEFT) = 0.5%
3. MEMBRANE - PVC COATED POLYESTER SCRIM

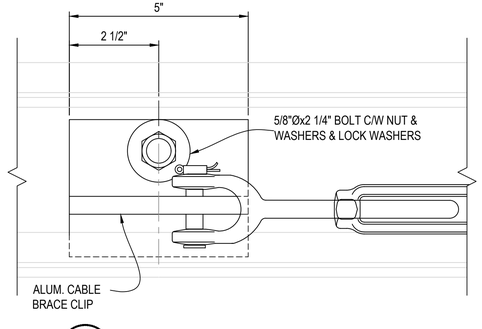
WARP DIRECTION IS THE SPAN DIRECTION FOR THE FABRIC FOR THIS STRUCTURE.
ALL HORIZONTAL SEAMS = 1 INCH



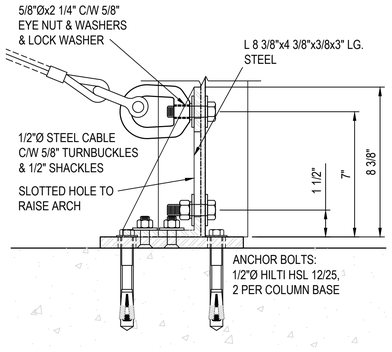
4 S-6 CABLE BRACING ELEVATION
3/8"=1'-0"



5 S-6 CABLE BRACE SECTION
6"=1'-0"



6 S-6 CABLE BRACE BRACKET ELEVATION
6"=1'-0"



7 S-6 5"x6" BEAM BASE PLATE - SECTION
3"=1'-0"

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ARCHITECTURAL MEMBRANE

OUTER MEMBRANE & DAYLIGHT PANELS:
HERCULITE EXCEL 18 ARCHITECTURAL MEMBRANE W/POLYURETHANE TOP COAT
MEETS FIRE PROPAGATION CRITERIA OF:
- CALIFORNIA STATE FIRE MARSHALL
- NFPA 701
- ASTM-E-84
- CAN/ULC-S-109
- CAN/ULC-S-102

INNER MEMBRANE/LINER:
HERCULITE EXCEL 14 MEMBRANE W/POLYURETHANE TOP COAT.
MEETS FIRE PROPAGATION CRITERIA OF:
- CALIFORNIA STATE FIRE MARSHALL
- NFPA 701
- ASTM-E-84
- CAN/ULC-S-109
- CAN/ULC-S-102

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MEAD & HUNT INC.

55'-0" x 51'-0"

SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

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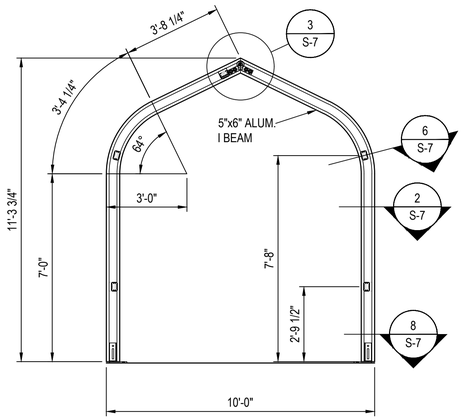
MEMBRANE, FLAT END, & CONN. DETAILS

DATE:	DRAWN BY:
06/25/2025	D. BENNETT

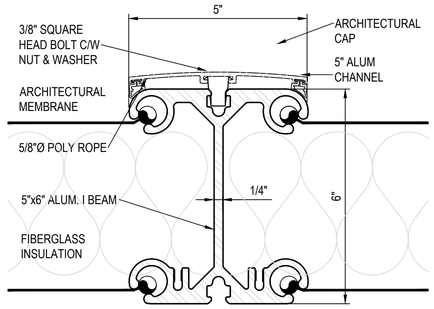
S-6

SPRUNG WO# 28303

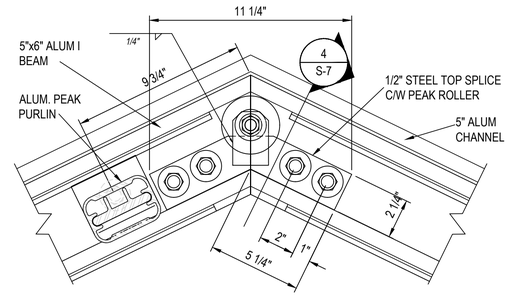
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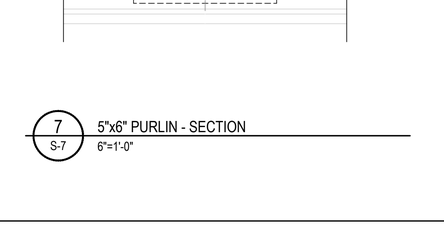
1 S-7 SECTION 10'-0" CONNECTOR
3/8"=1'-0"



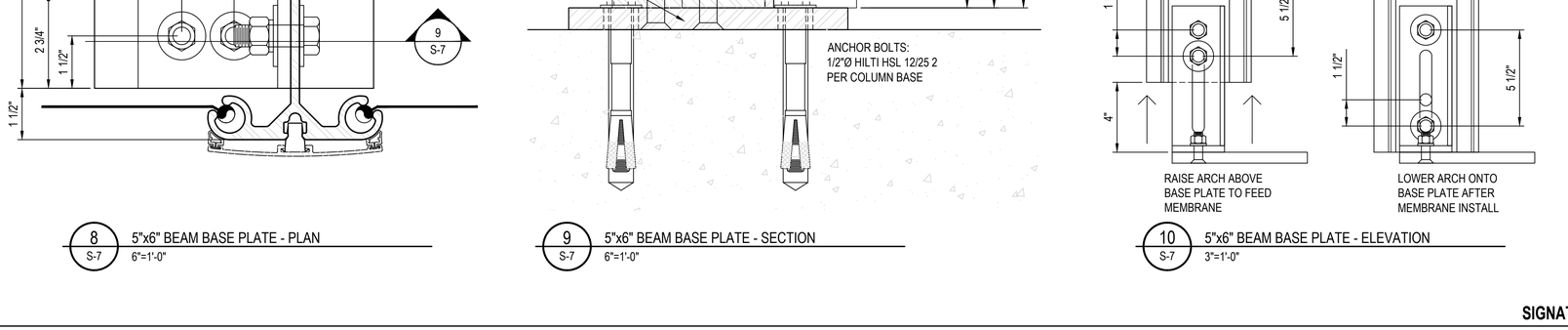
2 S-7 5"x6" INSUL. BEAM SECTION
6"=1'-0"



3 S-7 5"x6" TOP SPLICE
3"=1'-0"

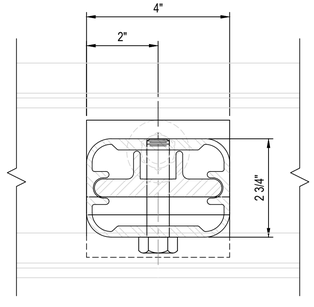


4 S-7 5"x6" TOP SPLICE - SECTION
6"=1'-0"

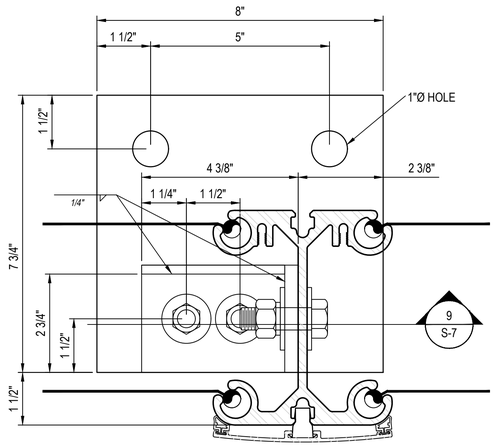


5 S-7 5"x6" PURLIN - ELEVATION
6"=1'-0" (FINAL CONDITION)

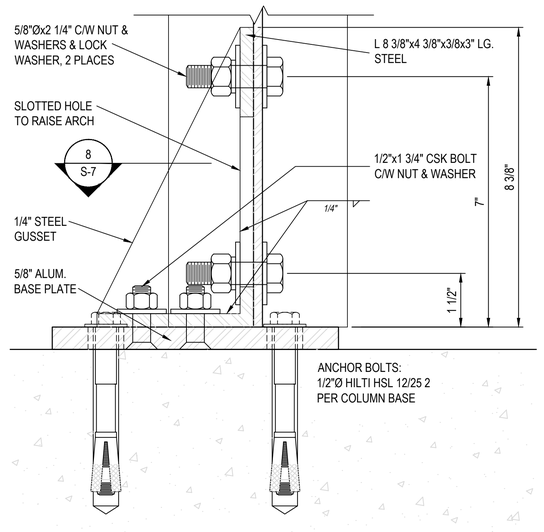
6 S-7 5"x6" PURLIN - ELEVATION
6"=1'-0"



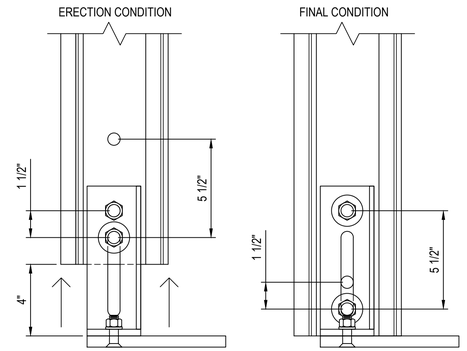
7 S-7 5"x6" PURLIN - SECTION
6"=1'-0"



8 S-7 5"x6" BEAM BASE PLATE - PLAN
6"=1'-0"



9 S-7 5"x6" BEAM BASE PLATE - SECTION
6"=1'-0"



10 S-7 5"x6" BEAM BASE PLATE - ELEVATION
3"=1'-0"

SIGNATURE SERIES

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SALT LAKE CITY, UTAH
PH. (801) 486.6848
info@canyonsstructural.com
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MEAD & HUNT INC.

55'-0" x 51'-0"

SAN LUIS OBISPO AIRPORT
SAN LUIS OBISPO, CALIFORNIA, UNITED STATES

REV.	MM/DD/YY	BY	DESCRIPTION
2			
3			
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9			

CONNECTOR CORRIDOR DETAILS

DATE: 06/25/2025
DRAWN BY: D. BENNETT

S-7

SPRUNG WO# 28303

PROJECT: ESUSLO-PAC-CONNECTOR-A.DWT - CONFIG: COUNTY 2020 PAC-CONNECTOR-A.DWG - 6/26/2025 4:01:21 PM

ABBREVIATIONS

∠	ANGLE
@	AT
AB	ANCHOR BOLT
AC	ACOUSTIC
ACC	ACCESS
ACT	ACOUSTIC CEILING TILE
ACP	ACOUSTIC CEILING PANEL
AD	AREA DRAIN
ADD	ADDITIONAL
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASPH	ASPHALT
BB	BOND BEAM
BD	BOARD
BF	BOTH FACES
BFC	BELOW FINISH CEILING
BG	BUMPER GUARD
BIT	BITUMINOUS
BLDG	BUILDING
BLKG	BLOCKING
BLKT	BLANKET
BM	BEAM/BENCH MARK
BLK	BLOCK
BOT	BOTTOM
BRG	BEARING
BRKR	BREAKER
BRK	BRICK
BRKT	BRACKET
BS	BACK SPLASH
BSMT	BASEMENT
BTWN	BETWEEN
	CHANNEL
CAB	CABINET
CER	CERAMIC
CFCI	CONTRACTOR FURNISHED, CONTRATOR INSTALLED
CG	CORNER GUARD
CH	COAT HOOK
CIP	CAST IN PLACE
CJ JOINT	CONTROL JOINT/CONSTRUCTION
CLG	CEILING
CLO	CLOSET/CLOSURE
CLR	CLEAR
COL	COLUMN
COMB	COMBINATION
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECTION/CONNECT
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CORR	CORRIDOR
CPT	CARPET
CR	COAT RACK/CURTAIN ROD
CSG	CASING
CT	CERAMIC TILE
CTR	CENTER/COUNTER
CTSK	COUNTERSUNK
CUH	CABINET UNIT HEATER
CW	COLD WATER
D	DEPTH
DBL	DOUBLE
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIR	DIRECTION
DIV	DIVISION
DM	DEMOUNTABLE PARTITION
DN	DOWN
DO	DITTO
DR	DOOR
DRWR	DRAWER
DS	DOWNSPOUT
DWG	DRAWING
DWL	DOWEL
DWS	DEFORMED WELDED STUD
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EACH FACE
EH HOOD	ELECTRICAL HEATER/EXHAUST
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR/ELEVATION
EMBED	EMBEDDED
EMER	EMERGENCY
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EMERGENCY SHOWER
ESR	ELASTOMERIC SHEET ROOFING
ETR	EXISTING TO REMAIN
EVC	ELASTIC VINYL COATING
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXC	EXCAVATE
EXP	EXPANSION
EXPD	EXPOSED
EXPF	EXPLOSION PROOF
EXT	EXTERIOR
FA	FIELD ADJUSTABLE
FV	FIELD VERIFY
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FIN	FINISH
FIX	FIXTURE
FLEX	FLEXIBLE
FLR	FLOOR
FLRG	FLOORING
FP	FIREPROOF/FIRE PROTECTION
FR	FIRE RETARDANT
FS	FULL SIZE/FULL SCALE
FT	FEET
FTG	FOOTING
FURG	FURRING
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GEN	GENERAL
GFCI	GOVERNMENT FURNISHED, CONTRACTOR INSTALLED
GFGI	GOVERNMENT FURNISHED, GOVERNMENT INSTALLED
GFRC	GLASS FIBER REINFORCED CONCRETE
GFRG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS
GMU	GLAZED MASONRY UNIT
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
H	HEIGHT
HDBD	HARDBOARD
HDCP	HANDICAPPED
HDWD	HARDWOOD
HDWE	HARDWARE
HK	HOOK
HM	HOLLOW METAL
HP	HIGH POINT
HR	HANDRAIL
HT	HEIGHT
HVAC	HEATING VENTILATION AND AIR CONDITIONING
HWS	HEAD WELDED STUDS
ID	INSIDE DIAMETER
IMP	INSULATED METAL PANEL
IN	INCHES
INFO	INFORMATION
INSUL	INSULATION
INT	INTERIOR
IPW	INSULATED PLENUM WALL
IRF	INSULATED ROOF FILL
JAN	JANITOR
JS	JANITOR SINK
JST	JOIST
JT	JOINT
KD	KNOCKED DOWN
KO	KNOCK-OUT / KNEE OPENING
L	LENGTH
LAB	LABORATORY
LAM	LAMINATED
LB	POUND
LBS	POUNDS
LD	LINEAR DIFFUSER
LDG	LANDING
LF	LINEAR FOOT
LG	LONG
LGT	LIGHT
LKR	LOCKER
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LP	LOW POINT
LSH	LONG SLOTTED HOLE
LTG	LIGHTING
LVR	LOUVER
LWC	LIGHTWEIGHT CONCRETE
MACH	MACHINE
MAN	MANUAL
MAR	MARBLE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MBW	MASONRY BEARING WALL
MC	MECHANICAL CONTRACTOR
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MEMB	MEMBRANE
MET	METAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MK	MARK
ML	METAL LATH
MLDG	MOLDING
MO	MASONRY OPENING
MP	METAL PARTITION
MS	MACHINE SCREW
MTD	MOUNTED
MTG	MOUNTING
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NS	NONSHRINK
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER/OVERFLOW DRAIN
OFF	OFFICE
OPNG	OPENING
OPP	OPPOSITE
OZ	OUNCE
PART	PARTITION
PC	PIECE
PCC	PRECAST CONCRETE
PCPL	PORTLAND CEMENT PLASTER
PDWR	PAPER TOWEL DISPENSER & WASTE RECEPTACLE
PH	PHILLIPS HEAD/PHASE
PL	PLASTIC LAMINATE/PLATE/PROPERTY LINE
PLAS	PLASTER
PLBG	PLUMBING
PLYWD	PLYWOOD
PM	PROTECTED METAL
PNL	PANEL
PNLG	PANELING
POL	POLISHED
PR	PAIR
PRE FAB	PREFABRICATED
PRE FIN	PRE-FINISHED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT/PAINT
PTM	PAINT TO MATCH
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
QTY	QUANTITY
RAD	RADIUS
RAH	ROOFTOP AIR HANDLING UNIT
RB	RUBBER BASE
RC	REINFORCED CONCRETE
RCP	RADIANT CEILING PANEL / REFLECTED CEILING PLAN
RD	ROOF DRAIN
REC	RECESSED
REF	REFERENCE
REINF	REINFORCING
REL	RELOCATE
REM	REMAINDER
REQD	REQUIRED
RES	RESILIENT
RET	RETURN
RI	ROUGH IN
RM	ROOM
RO	ROUGH OPENING
RT	RUBBER TILE
RUB	RUBBER
SAT	STANDARD AGGREGATE TOPPING
SB	SOIL BEARING
SC	SEAMLESS COATING
SCF	SPECIAL CONCRETE FINISH
SCHD	SCHEDULE
SD	SOAP DISPENSER
SE	SHELF EDGE
SECT	SECTION
SF	SAND FLOAT
SG	SUPPLY AIR GRILLE
SGL	SINGLE
SH	SHELF
SHD	SHOWER DOOR
SHT	SHEET
SIM	SIMILAR
SJ	STEEL JOIST
SLV	SHORT LEG VERTICAL
SM	SMOOTH
SND	SANITARY NAPKIN DISPENSER
SNV	SANITARY NAPKIN VENDER
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SR	SHOWER ROD
SS	STAINLESS STEEL
ST	STREET
STD	STANDARD
STL	STEEL
STO	STORAGE
STRU	STRUCTURAL/STRUCTURE
SUSP	SUSPENDED
SV	SHEET VINYL
SYM	SYMMETRICAL
T & B	TOP AND BOTTOM
TB	TACKBOARD/TOWEL BAR
TBR	TO BE REMOVED
TCP	THIN COAT PLASTER
TD	TOWEL DISPENSER
TDW	TOWEL DISPENSER AND WASTE
TEMP	TEMPERATURE/TEMPERED
TER	TERRAZZO
TEX	TEXTURE
TFC	TROWELED FLOOR COVERING
T & G	TONGUE AND GROOVE
THK	THICK
TOB	TOP OF BEAM
TOC	TOP OF CURB/TOP OF CONCRETE
TOD	TOP OF DECK/TOP OF DUCT ELEVATION
TOF	TOP OF FOOTING
TOJ	TOP OF JOIST
TOP	TOP OF PIPE ELEVATION
TOS	TOP OF SLAB/TOP OF STEEL
TOW	TOP OF WALL
TPG	TOPPING
TPH	TOILET PAPER HOLDER
TRAN	TRANSOM
TRANS	TRANSVERSE
TS	TUBE STEEL
TWS	THREADED WELDED STUD
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
V	VINYL
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VOL	VOLUME
VWC	VINYL WALL COVERING
W	WIDE FLANGE STEEL BEAM
W/	WITH
WAF	WELDED ANGLE FRAME
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WF	WIDE FLANGE
WG	WIRE GLASS
W/O	WITHOUT
WP	WEATHERPROOF
WPFG	WATERPROOFING
WR	WASTE RECEPTACLE
WSCT	WAINSCOT
WSTP	WEATHERSTRIP
WTR	WATER
WWF	WELDED WIRE FABRIC
X	EXISTING

ABBREVIATIONS ABOVE ARE FOR ARCHITECTURAL SHEETS ONLY

HATCH SYMBOLS

EARTHWORK	PLYWOOD
GRAVEL	FINISH LUMBER
PLASTER, SAND, GROUT	WOOD STUDS, BLOCKING
CONCRETE	STEEL STUDS
CONCRETE MASONRY	GYPSUM WALLBOARD
CLAY MASONRY	ACOUSTICAL TILE
PRECAST CONCRETE	BATT INSULATION
METAL	RIGID INSULATION

LEGEND - PLAN SYMBOLS

- SIM / 1 / A-101 — BUILDING SECTION SYMBOL
- SIM / 1 / A-101 — WALL SECTION SYMBOL
- 1 / A-101 — DETAIL SYMBOL
- 1 / A-101 — ENLARGED PLAN SYMBOL
- A-201 / 1 — EXTERIOR ELEVATION SYMBOL
- A-211 / 1 — INTERIOR ELEVATION SYMBOL
- 4.XXX — KEYED NOTE IDENTIFICATION
- ROOM NAME / 000 — ROOM NAME AND NUMBER
- XXX / X — WALL TYPE IDENTIFICATION
- W? — WINDOW IDENTIFICATION
- 1014 — DOOR IDENTIFICATION
- 1 HOUR FIRE RATED WALL
- F.E. — FIRE EXTINGUISHER - SURFACE MOUNT
- F.E.C. — FIRE EXTINGUISHER CABINET AND FIRE EXTINGUISHER - SEMI-RECESSED
- FD — FLOOR DRAIN
- A100 — EXISTING GRID LINES
- A100 — NEW GRID LINES
- XXX / X' - X" — LEVEL OR SPOT ELEVATIONS
- 10'-10" / ACP-X — CEILING HEIGHT & FINISH

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
NOTES, SYMBOLS & ABBREVIATIONS

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-001

12/1/2026 3:30:20 PM C:\Revit Local\222814.02-A-R24_Marco.PineC02GU.rvt

HOUR RATINGS
"MA" SERIES

PTN TYPE	CMU WIDTH	AVAILABLE FIRE RESISTANCE	NOTES
MA4 1H	3 5/8"	1 HOUR (SOLID BLOCK ONLY)	
MA6 1H	5 5/8"	1 HOUR	
MA6 2H	5 5/8"	2 HOUR	
MA6 3H	5 5/8"	3 HOUR (SOLID BLOCK ONLY)	
MA8 1H	7 5/8"	1 HOUR	
MA8 2H	7 5/8"	2 HOUR	
MA8 3H	7 5/8"	3 HOUR (SOLID BLOCK ONLY)	
MA8 4H	7 5/8"	4 HOUR (SOLID BLOCK ONLY)	
MA0 2H	9 5/8"	2 HOUR	
MA2 2H	11 5/8"	2 HOUR	
MA2 3H	11 5/8"	3 HOUR	
MA2 4H	11 5/8"	4 HOUR	
MA14 4H	13 5/8"	4 HOUR	
MA16 4H	15 5/8"	4 HOUR	

1 HOUR
"SA" SERIES

PTN TYPE	STUD WIDTH	WALL WIDTH	CONSTRUCTION TESTS	NOTES
SA2 1H	1 1/2"	3 3/4"	GA FILE NO WP1070 UL DES NO U448	1 HOUR REQD 1 1/2" MIN. OF 3 PSF INSUL.
			UL DES NO U494	1 HR REQD 2 1/2" MIN
SA3 1H	3 5/8"	4 7/8"	GA FILE NO WP1072 GA FILE NO WP1200 UL DES NO U465	-
SA4 1H	4"	5 1/4"	GA FILE NO WP1072 GA FILE NO WP1200 UL DES NO U465	-
SA6 1H	6"	7 1/4"	GA FILE NO WP1072 GA FILE NO WP1200 UL DES NO U465	-
SA8 1H	8"	9 1/4"	GA FILE NO WP1072 GA FILE NO WP1200 UL DES NO U465	-

2 HOUR
"SC" SERIES

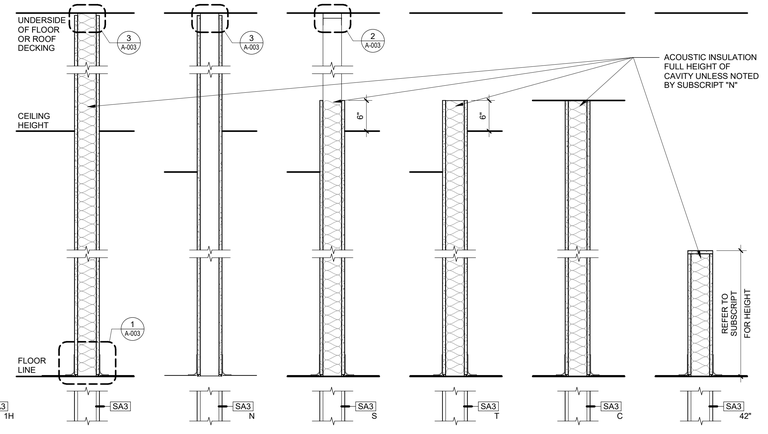
PTN TYPE	STUD WIDTH	WALL WIDTH	CONSTRUCTION TESTS	NOTES
SC2 2H	1 1/2"	5"	GA FILE NO WP1530 UL DES NO U412	1 1/2" INSUL.
SC3 2H	3 5/8"	6 1/8"	GA FILE NO WP1615 GA FILE NO WP1549 UL DES NO U411	2 1/2" INSUL.
SC4 2H	4"	6 1/2"	GA FILE NO WP1615 GA FILE NO WP1549 UL DES NO U411	-
SC6 2H	6"	8 1/2"	GA FILE NO WP1615 GA FILE NO WP1549 UL DES NO U411	-
SC8 2H	8"	10 1/2"	GA FILE NO WP1615 GA FILE NO WP1549 UL DES NO U411	-

4 Partition Fire Ratings - Examples
1" = 1'-0"

PARTITION GENERAL NOTES:

1. PARTITIONS SHALL BE TYPE "SA3" UNLESS OTHERWISE NOTED.
2. ALL ELEMENTS OF ACOUSTIC PARTITIONS SHALL EXTEND TO ROOF OR FLOOR DECK ABOVE AND ALL JOINTS AND PENETRATIONS OF ACOUSTIC RATED PARTITIONS SHALL BE FILLED AND SEALED.
3. REFER TO SHEET A-003 FOR PARTITION DETAILS.
4. REFER TO "INTERIOR PARTITION TYPE MODIFIERS" FOR SYMBOLS USED TO IDENTIFY ADDITIONAL REQUIREMENTS OR MODIFICATIONS TO BASIC PARTITION TYPES.
5. PARTITION TYPES DESCRIBE GENERAL REQUIREMENTS FOR PARTITIONS. REFER TO PRODUCT MANUFACTURERS' SPECIFICATIONS AND REQUIREMENTS FOR APPLICABLE TESTING AGENCIES FOR SPECIFICS OF PARTITION CONSTRUCTION.
6. PARTITION REQUIREMENTS SHOWN ARE CONSIDERED MINIMUM STANDARDS. WHERE CONDITIONS OF THE WORK CAUSE PARTITION(S) TO EXCEED LIMITS RECOMMENDED BY MANUFACTURER, REINFORCE PARTITION(S).
7. PENETRATIONS IN RATED PARTITIONS AND CONNECTIONS OF THE PARTITIONS TO OTHER PORTIONS OF THE WORK SHALL BE IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDED DETAILS AND IN COMPLIANCE WITH APPLICABLE TESTING AGENCY REQUIREMENTS.
8. WHERE A CLEAR DIMENSION OR OPENING IS REQUIRED OR NOTED, MEASURE DIMENSION TO FACE OF PARTITION FINISH.
9. REFER TO STRUCTURAL DRAWINGS FOR EXTENT AND DESCRIPTION OF INTERIOR STRUCTURAL WALLS NOT IDENTIFIED BY PARTITION TYPES.
10. INSTALL BLOCKING OR BACKER MATERIAL FOR ATTACHMENT/MOUNTING OF WALL HUNG ITEMS OR EQUIPMENT DESCRIBED IN THE DOCUMENTS.
11. FIRE RATED PARTITIONS: GA AND UL TEST NUMBERS MAY VARY DEPENDING ON THE MANUFACTURER OF COMPONENTS ACTUALLY USED.
12. PROVIDE 5/8" TYPE "X" GYPSUM BOARD (UNLESS NOTED OTHERWISE)
13. INSTALLATION OF GYPSUM BOARD, BACKER BOARD AND BASE BOARD SHALL CONFORM TO REQUIREMENTS FOR FIRE RATINGS AND ACOUSTICAL RATINGS.
14. TYPICAL FLOOR PLAN DIMENSIONS OF PARTITIONS ARE TO THE NOMINAL FINISH FACE OF GYPSUM BOARD UNLESS NOTED TO THE CENTERLINE OF THE PARTITION.
15. WHERE PARTITIONS AND/OR FURRING MEET, MAINTAIN A FLUSH SURFACE ON THE SIDE WHERE THE FINISH IS STRAIGHT OR CONTINUOUS UNLESS OTHERWISE NOTED.

PARTITION TYPE SYMBOL AND SUBSCRIPT DEFINITIONS:



SUBSCRIPT (#H) — RATED PARTITION

NO SUBSCRIPT — EXTEND TOTAL PARTITION TO STRUCTURE

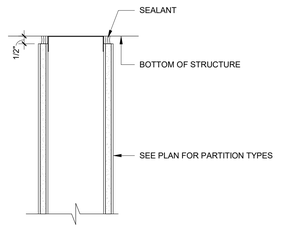
SUBSCRIPT (N) — NO ACOUSTIC INSULATION

SUBSCRIPT (S) — STUDS TO STRUCTURE, GYP BD TO 6" ABOVE HIGHEST ADJC. CEILING

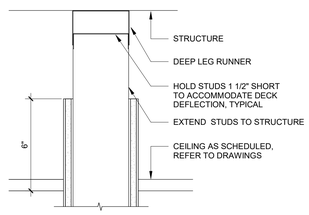
SUBSCRIPT (T) — EXTEND TOTAL PARTITION TO 6" ABOVE ADJC. CEILING (BRACE AS NECESSARY)

SUBSCRIPT (C) — EXTEND TOTAL PARTITION TO CEILING (BRACE AS NECESSARY)

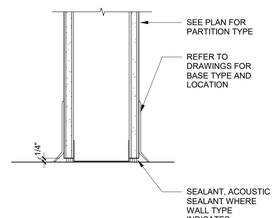
SUBSCRIPT (XX") — PARTITION HEIGHT IN INCHES AS NOTED, SEE ABOVE DETAIL FOR OTHER REQUIREMENTS



3 PARTITION HEAD
3" = 1'-0"



2 PARTITION HEAD
3" = 1'-0"



1 GYP WALL BASE
3" = 1'-0"

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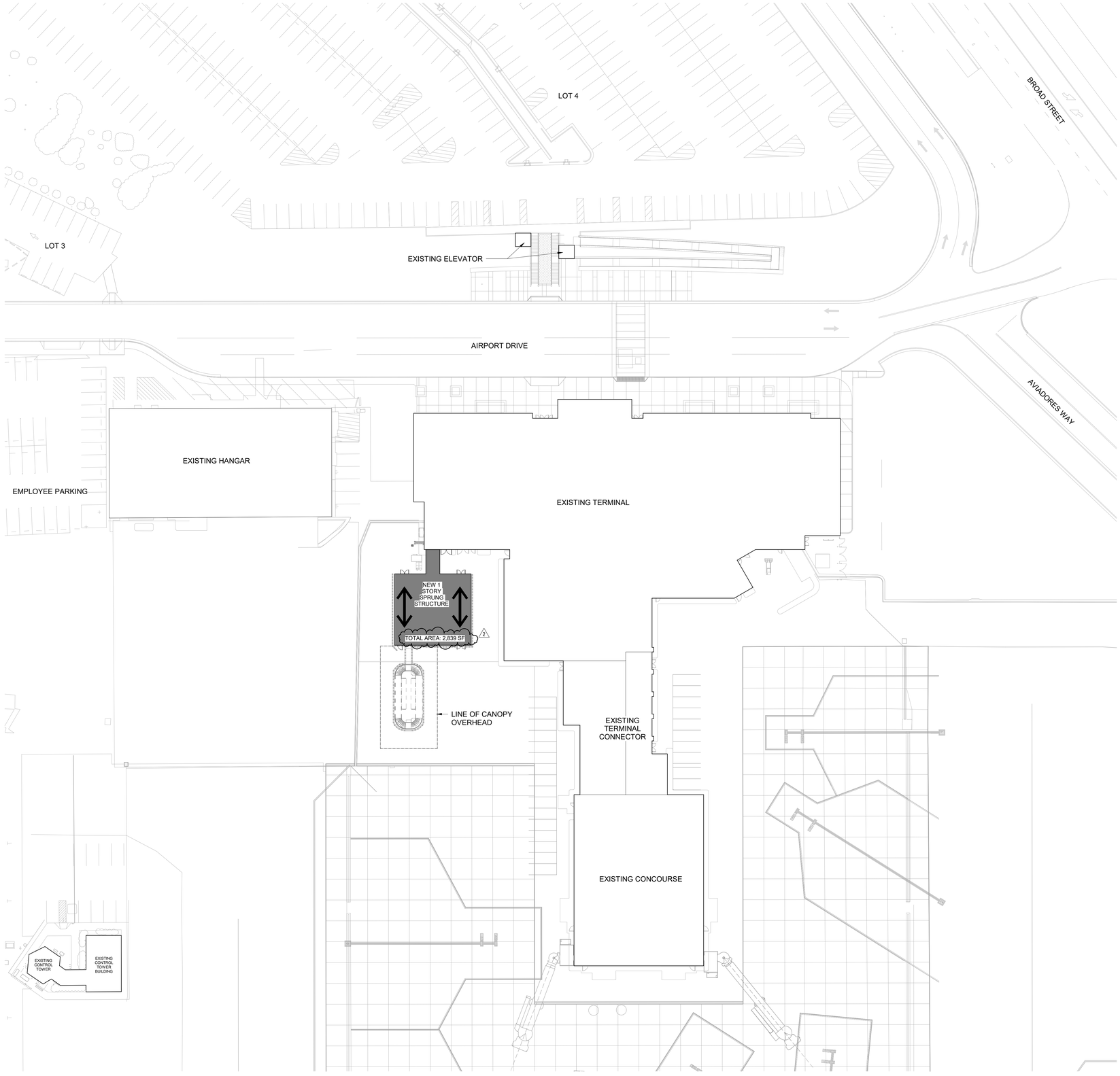
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SHEET CONTENTS
INTERIOR PARTITION TYPES

SHEET NO.:
A-003

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

1/21/2026 3:30:20 PM C:\Revit Local\222814.02-A-R24_Marco.PrinCQ2GU.rvt



TRUE NORTH PLAN NORTH

1 **SITE PLAN**
1" = 30'-0"

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BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC

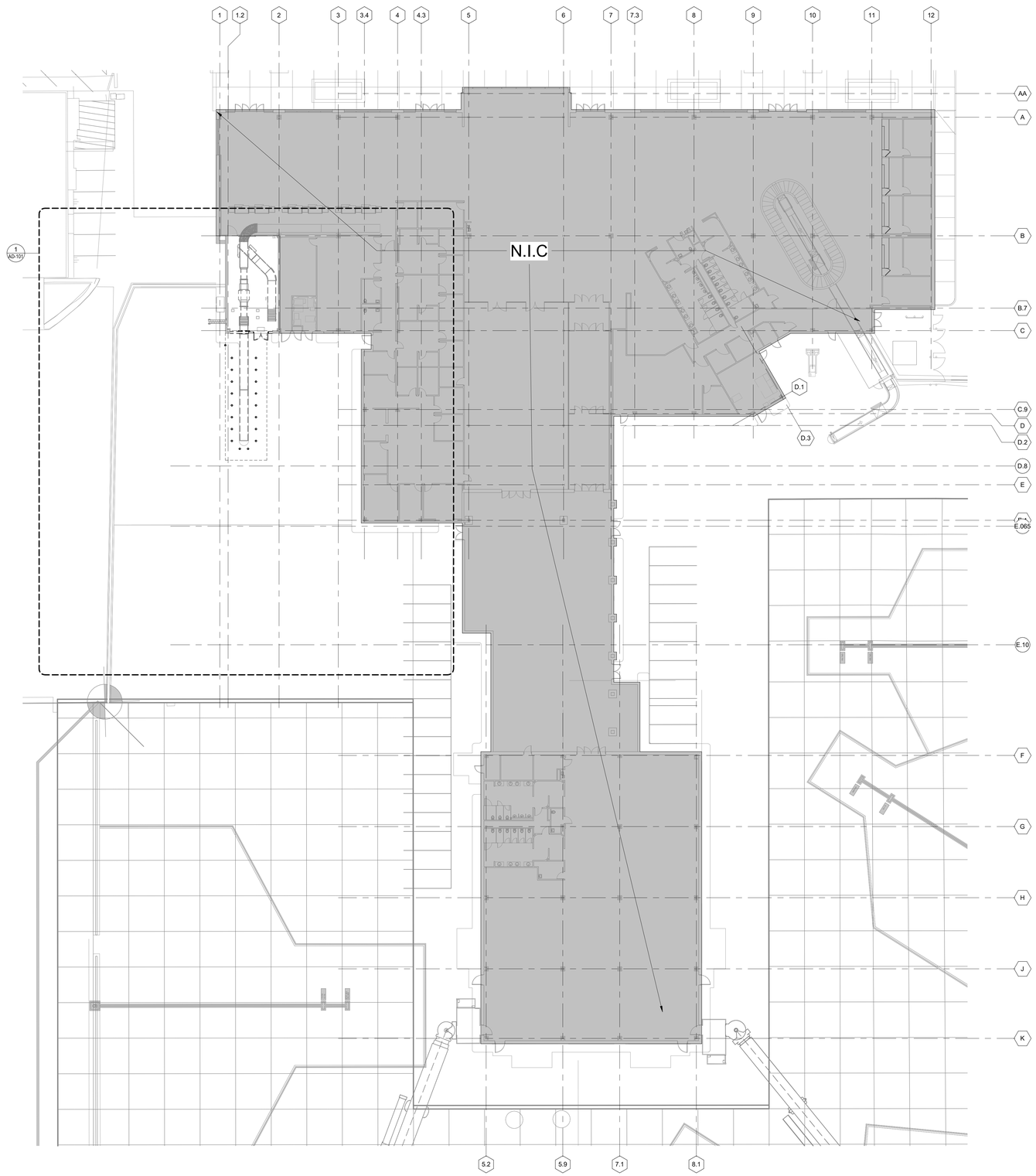
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SHEET CONTENTS:
ARCHITECTURAL SITE PLAN

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
CERTIFIED
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-010

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N 1 **FIRST FLOOR OVERALL DEMOLITION PLAN**
1" = 20'-0"

DEMOLITION PLAN GENERAL NOTES:

1. THE GENERAL CONTRACTOR SHALL VERIFY ALL BUILDING AND SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH ANY SCHEDULED DEMOLITION WORK.
2. THE GENERAL CONTRACTOR SHALL COORDINATE ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING WORK AND ALL SUBCONTRACTORS FOR DEMOLITION AND REPAIR WORK.
3. IT IS THE INTENT OF THESE DRAWINGS TO INDICATE THE REMOVAL OF ALL ITEMS WHICH INTERFERE WITH THE FINAL CONSTRUCTION AS SHOWN ON THE FLOOR PLANS, ELEVATIONS, DETAILS, AND SCHEDULES. ALL FLOOR FINISHES, BASE, ABANDONED FURNITURE, WINDOW TREATMENTS, SHELVING, SIGNAGE, AND ROOFING MATERIALS SHALL BE DEMOLISHED IN THEIR ENTIRETY.
4. REMOVE ALL ITEMS OF DEMOLITION WORK FROM THE PROJECT DAILY AND DISPOSE OF PROPERLY.
5. EXISTING CONCRETE AND STEEL STRUCTURE TO REMAIN, TYP. PROTECT COLUMNS, PILASTERS, BEAMS, AND SLABS.
6. THE EXISTING MECHANICAL, ELECTRICAL,TECHNOLOGY, AND PLUMBING ITEMS AND/OR SYSTEMS, AND GAS, WATER AND ELECTRICAL METERS ARE GENERALLY INTENDED TO REMAIN. WHERE WORK CONFLICTS WITH NEW WORK, DEMOLITION OR REROUTING OF EXISTING INFRASTRUCTURE SHALL BE REQUIRED, REF: MEP FOR ALL ITEMS TO BE REUSED TYP. ALL ITEMS TO BE DEMOLISHED SHALL BE REMOVED IN THEIR ENTIRETY, BACK TO THE ORIGINAL SOURCE. SURROUNDING MATERIALS WHICH ARE DISTURBED OR DEMOLISHED THAT ARE SCHEDULED TO REMAIN SHALL BE PATCHED WITH LIKE SURROUNDING MATERIALS, TYPICAL.
7. ALL EXISTING CONVEYOR BELT/ BAGGAGE HANDLING EQUIPMENT IN BAGGAGE SCREENING AREA TO BE REMOVED.
8. DEMOLISH CONCRETE FLOOR SLABS AS REQUIRED TO INSTALL NEW EQUIPMENT, UNDERGROUND CONDUIT, PLUMBING SYSTEMS, AND FLOOR DRAINS, REF: STRUCTURAL, EQUIPMENT, ELECTRICAL, PLUMBING DEMOLITION, AND PLUMBING DRAWINGS.
9. PROTECT EXISTING SURFACES TO REMAIN DURING DEMOLITION AND CONSTRUCTION.
10. REPAIR OR REPLACE ANY EXISTING CONSTRUCTION (WINDOWS, WALLS, DOORS, CEILINGS, FLOORS, ETC.) TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION. REPLACEMENT MATERIAL SHALL MATCH IN KIND.

DEMOLITION LEGEND:

- EXISTING CONSTRUCTION TO REMAIN
- EXISTING CONSTRUCTION TO BE DEMOLISHED, TYP (U.N.O.)
- EXISTING DOOR TO REMAIN
- DOOR, FRAME, AND HARDWARE TO BE DEMOLISHED COMPLETE, TYP (U.N.O.)

KEY PLAN

Mead & Hunt

Mead & Hunt, Inc.
3110 E.Guasti Road,
Suite 330
Ontario, CA 91761
phone: 909-467-8560
meadhunt.com

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

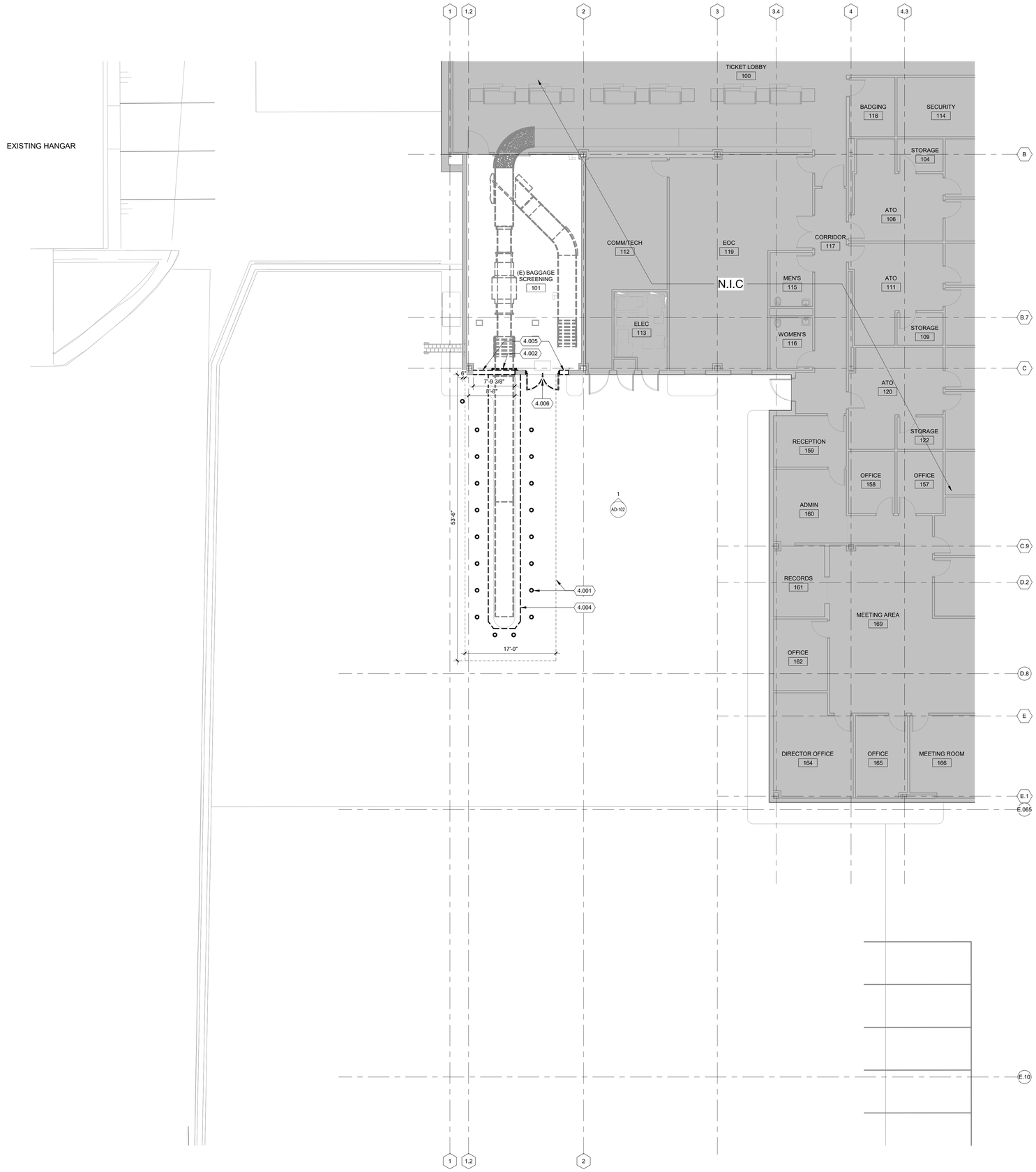
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DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
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SHEET CONTENTS
FIRST FLOOR OVERALL DEMOLITION PLAN

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
AD-100

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DEMOLITION PLAN GENERAL NOTES:

1. THE GENERAL CONTRACTOR SHALL VERIFY ALL BUILDING AND SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH ANY SCHEDULED DEMOLITION WORK.
2. THE GENERAL CONTRACTOR SHALL COORDINATE ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING WORK AND ALL SUBCONTRACTORS FOR DEMOLITION AND REPAIR WORK.
3. IT IS THE INTENT OF THESE DRAWINGS TO INDICATE THE REMOVAL OF ALL ITEMS WHICH INTERFERE WITH THE FINAL CONSTRUCTION AS SHOWN ON THE FLOOR PLANS, ELEVATIONS, DETAILS, AND SCHEDULES. ALL FLOOR FINISHES, BASE, ABANDONED FURNITURE, WINDOW TREATMENTS, SHELVING, SIGNAGE, AND ROOFING MATERIALS SHALL BE DEMOLISHED IN THEIR ENTIRETY.
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5. EXISTING CONCRETE AND STEEL STRUCTURE TO REMAIN, TYP. PROTECT COLUMNS, PILASTERS, BEAMS, AND SLABS.
6. THE EXISTING MECHANICAL, ELECTRICAL,TECHNOLOGY, AND PLUMBING ITEMS AND/OR SYSTEMS, AND GAS, WATER AND ELECTRICAL METERS ARE GENERALLY INTENDED TO REMAIN. WHERE WORK CONFLICTS WITH NEW WORK, DEMOLITION OR REROUTING OF EXISTING INFRASTRUCTURE SHALL BE REQUIRED, REF: MEP FOR ALL ITEMS TO BE REUSED TYP. ALL ITEMS TO BE DEMOLISHED SHALL BE REMOVED IN THEIR ENTIRETY, BACK TO THE ORIGINAL SOURCE. SURROUNDING MATERIALS WHICH ARE DISTURBED OR DEMOLISHED THAT ARE SCHEDULED TO REMAIN SHALL BE PATCHED WITH LIKE SURROUNDING MATERIALS, TYPICAL.
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9. PROTECT EXISTING SURFACES TO REMAIN DURING DEMOLITION AND CONSTRUCTION.
10. REPAIR OR REPLACE ANY EXISTING CONSTRUCTION (WINDOWS, WALLS, DOORS, CEILINGS, FLOORS, ETC.) TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION. REPLACEMENT MATERIAL SHALL MATCH IN KIND.

DEMOLITION LEGEND:

- EXISTING CONSTRUCTION TO REMAIN
- EXISTING CONSTRUCTION TO BE DEMOLISHED, TYP (U.N.O.)
- EXISTING DOOR TO REMAIN
- DOOR, FRAME, AND HARDWARE TO BE DEMOLISHED COMPLETE, TYP (U.N.O.)

KEYED NOTES

4.001 REMOVE EXISTING CANOPY STRUCTURE AND FOUNDATIONS

4.002 REMOVE EXISTING SHUTTER AND SALVAGE FOR REINSTALLATION

4.004 REMOVE EXISTING BHS IMPACT PROTECTION TYP.

4.005 REMOVE PORTION OF EXISTING WALL

4.006 REMOVE EXISTING DOOR AND FRAME

N 1 **FIRST FLOOR DEMO PLAN - AREA A - Exist/Temp**
1/8" = 1'-0"

KEY PLAN

Mead & Hunt

Mead & Hunt, Inc.
3110 E.Guasti Road,
Suite 330
Ontario, CA 91761
phone: 909-467-8560
meadhunt.com

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

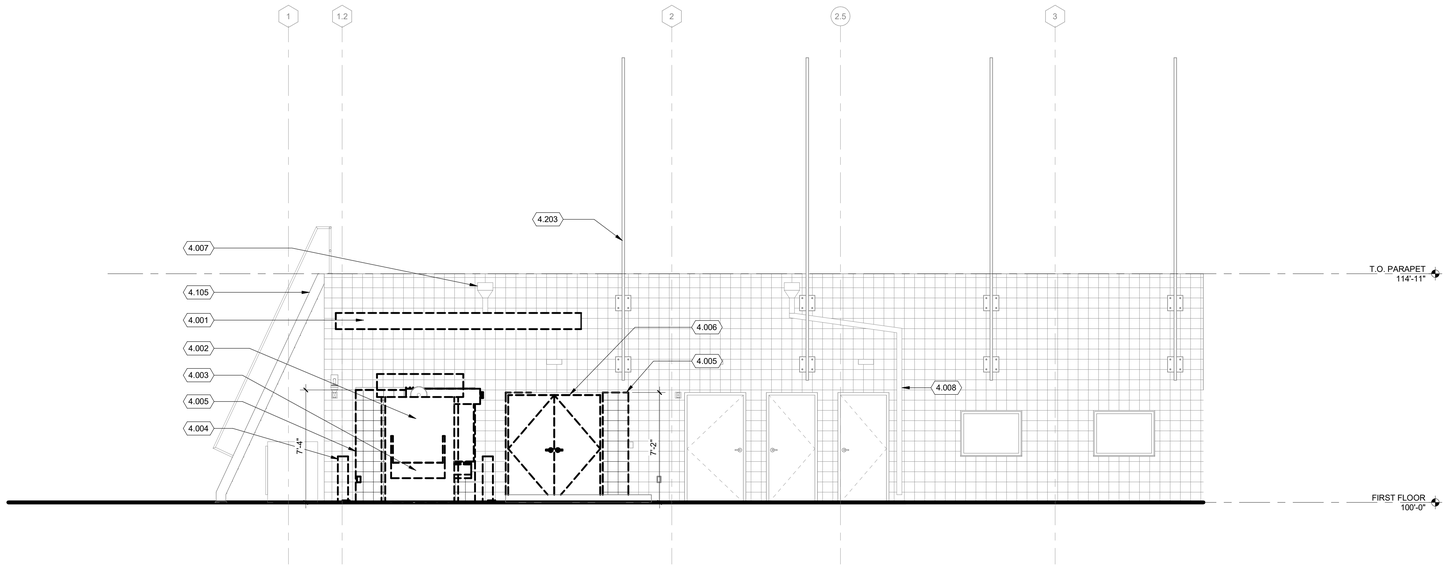
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SHEET CONTENTS
FIRST FLOOR DEMOLITION PLAN - AREA A

SHEET NO.:
AD-101

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

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1 TERMINAL ELEVATION SOUTH - DEMO

1/4" = 1'-0"

KEYED NOTES

4.001	REMOVE EXISTING CANOPY STRUCTURE AND FOUNDATIONS
4.002	REMOVE EXISTING SHUTTER AND SALVAGE FOR REINSTALLATION
4.003	REMOVE EXISTING BHS AND SALVAGE FOR REINSTALLATION. REFER TO BHS DRAWINGS
4.004	REMOVE EXISTING BHS IMPACT PROTECTION TYP.
4.005	REMOVE PORTION OF EXISTING WALL
4.006	REMOVE EXISTING DOOR AND FRAME
4.007	PROTECT EXISTING SCUPPER, REMOVE DOWNSPOUT
4.008	PROTECT EXISTING DOWNSPOUT IN PLACE
4.105	EXISTING ROOF ACCESS LADDER, PROTECT IN PLACE
4.203	EXISTING ANTENNA MASTS TYP.

KEY PLAN

Mead & Hunt, Inc.
3110 E.Guasti Road,
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Ontario, CA 91761
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meadhunt.com

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LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

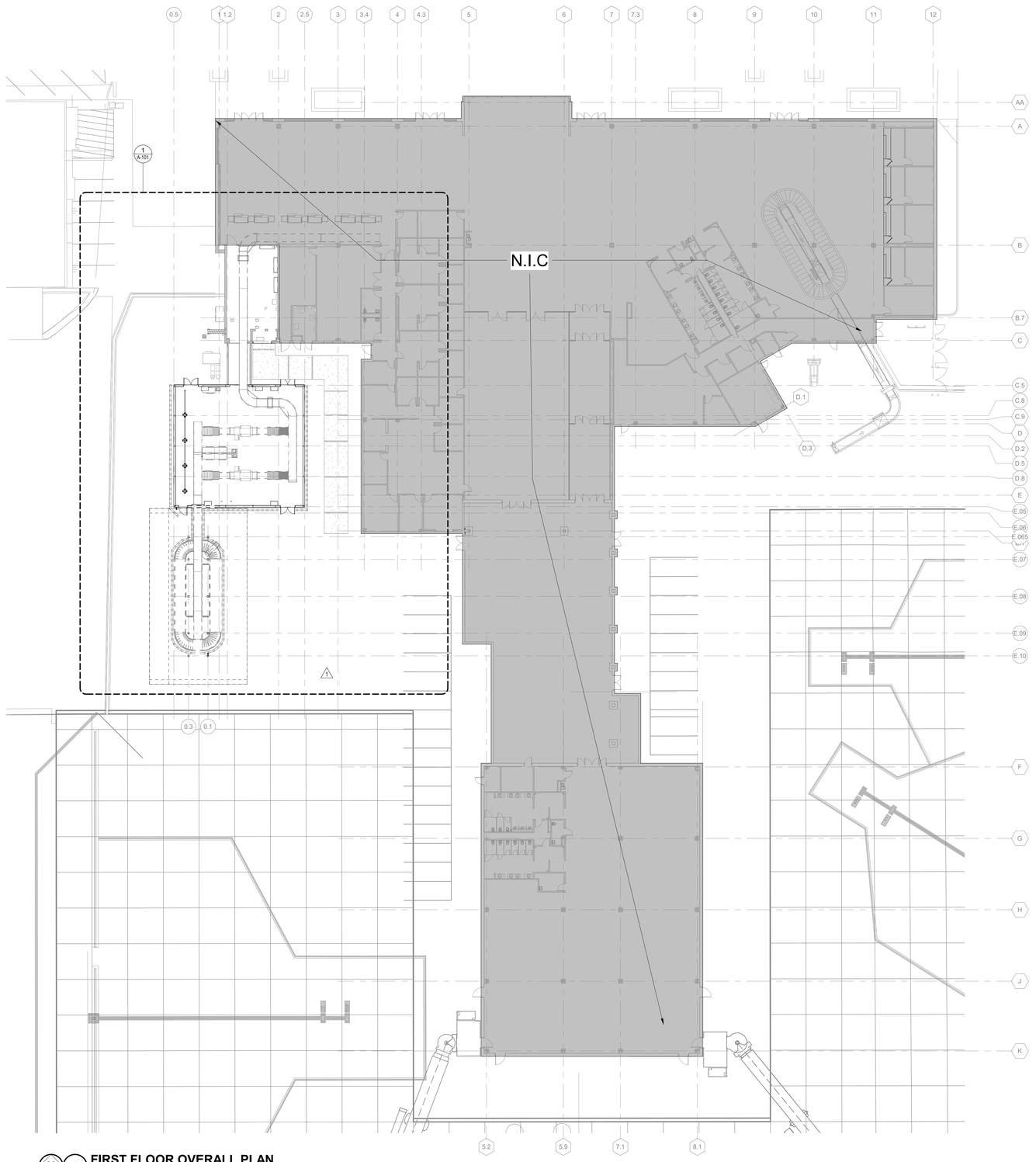
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SHEET CONTENTS
DEMOLITION ELEVATIONS

SHEET NO.:
AD-102

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N 1 **FIRST FLOOR OVERALL PLAN**
1" = 20'-0"

FLOOR PLAN GENERAL NOTES:

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON SITE PLAN = 100'-0" ON ARCHITECTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
3. ALL INTERIOR DIMENSIONS ARE FROM FINISH FACE OF WALLS (I.E. GYPSUM WALLBOARD OR CMU), UNLESS NOTED OTHERWISE.
4. FINISH FLOOR ELEVATIONS ARE TO THE TOP OF CONCRETE, UNLESS NOTED OTHERWISE.
5. REFERENCE SHEET G-011 AND G-021 FOR ALL CODE, FIRE RATING, AND SEPARATION REQUIREMENTS.
6. GENERAL CONTRACTOR SHALL PATCH AND REPAIR EXISTING CONSTRUCTION (WALLS, DOORS, CEILINGS, FLOORS, ETC.) AS REQUIRED FROM DEMOLITION OR CONSTRUCTION TO ALLOW FOR THE PREP WORK AND NEW OR COMPLETION OF EXISTING FINISHES. REPAIRS OR REPLACEMENTS MUST BE DURABLE, SEAMLESS, AND MATCH THE EXISTING MATERIAL.
7. GENERAL CONTRACTOR SHALL PATCH ALL FLOOR AND WALL PENETRATIONS CAUSED BY DEMOLITION OF MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING, INCLUDING BUT NOT LIMITED TO PIPING AND CONDUIT RUNS, IN A MANNER THAT IS CONSISTENT WITH THE EXISTING FLOOR AND WALL CONSTRUCTION AND FINISH. ALL PENETRATIONS SHALL MEET REQUIRED FIRE RATINGS.
8. COORDINATE THE INSTALLATION OF ALL OWNER-SUPPLIED EQUIPMENT. REFERENCE PLANS, SPECS, AND INTERIOR ELEVATIONS FOR SPECIFIC EQUIPMENT AND ITS INSTALLATION REQUIREMENTS.
9. GENERAL CONTRACTOR SHALL PROVIDE BLOCKING, STIFFENERS, BRACINGS, BACKING PLATES, SUPPORTING BRACKETS, AND NECESSARY SELECTIVE DEMOLITION REQUIRED FOR THE PROPER INSTALLATION OF ALL CASEWORK, TOILET ROOM ACCESSORIES, TOILET PARTITIONS AND MISCELLANEOUS EQUIPMENT.
10. REFERENCE G-101 FOR SEQUENCING PHASING REQUIREMENTS.

KEYED NOTES

Mead & Hunt
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Ontario, CA 91761
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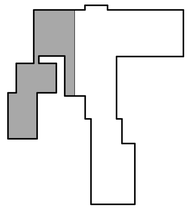
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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS



KEY PLAN

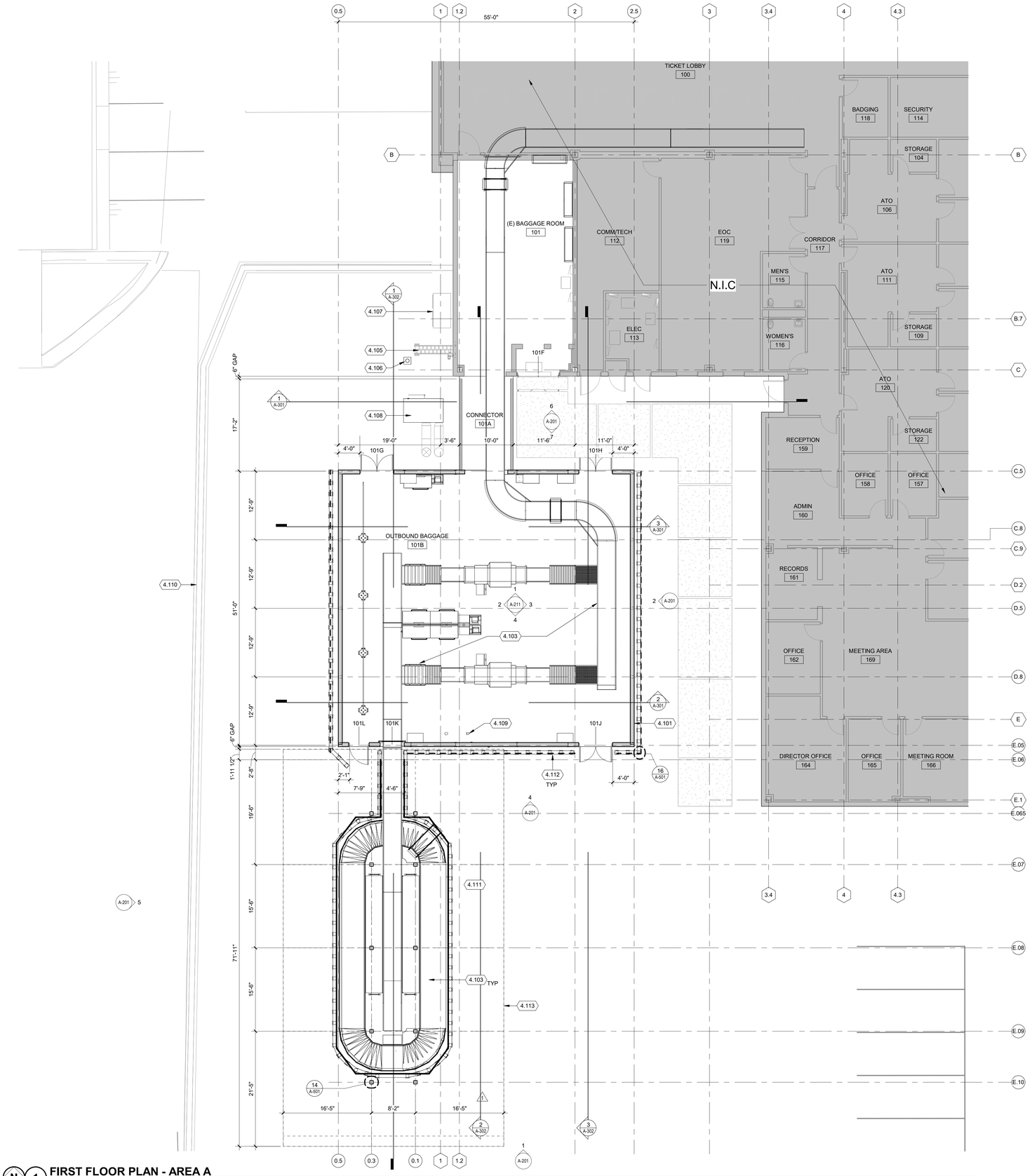
LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

M&H NO.: 1943000-222814.02
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SHEET CONTENTS
FIRST FLOOR OVERALL PLAN

SHEET NO.:
A-100

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FLOOR PLAN GENERAL NOTES:

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON SITE PLAN = 100'-0" ON ARCHITECTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
3. ALL INTERIOR DIMENSIONS ARE FROM FINISH FACE OF WALLS (I.E. GYPSUM WALLBOARD OR CMU), UNLESS NOTED OTHERWISE.
4. FINISH FLOOR ELEVATIONS ARE TO THE TOP OF CONCRETE, UNLESS NOTED OTHERWISE.
5. REFERENCE SHEET G-011 AND G-021 FOR ALL CODE, FIRE RATING, AND SEPARATION REQUIREMENTS.
6. GENERAL CONTRACTOR SHALL PATCH AND REPAIR EXISTING CONSTRUCTION (WALLS, DOORS, CEILINGS, FLOORS, ETC.) AS REQUIRED FROM DEMOLITION OR CONSTRUCTION TO ALLOW FOR THE PREP WORK AND NEW OR COMPLETION OF EXISTING FINISHES. REPAIRS OR REPLACEMENTS MUST BE DURABLE, SEAMLESS, AND MATCH THE EXISTING MATERIAL.
7. GENERAL CONTRACTOR SHALL PATCH ALL FLOOR AND WALL PENETRATIONS CAUSED BY DEMOLITION OF MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING, INCLUDING BUT NOT LIMITED TO PIPING AND CONDUIT RUNS, IN A MANNER THAT IS CONSISTENT WITH THE EXISTING FLOOR AND WALL CONSTRUCTION AND FINISH. ALL PENETRATIONS SHALL MEET REQUIRED FIRE RATINGS.
8. COORDINATE THE INSTALLATION OF ALL OWNER-SUPPLIED EQUIPMENT. REFERENCE PLANS, SPECS, AND INTERIOR ELEVATIONS FOR SPECIFIC EQUIPMENT AND ITS INSTALLATION REQUIREMENTS.
9. GENERAL CONTRACTOR SHALL PROVIDE BLOCKING, STIFFENERS, BRACINGS, BACKING PLATES, SUPPORTING BRACKETS, AND NECESSARY SELECTIVE DEMOLITION REQUIRED FOR THE PROPER INSTALLATION OF ALL CASEWORK, TOILET ROOM ACCESSORIES, TOILET PARTITIONS AND MISCELLANEOUS EQUIPMENT.
10. REFERENCE G-101 FOR SEQUENCING PHASING REQUIREMENTS.

KEYED NOTES

4.101 TENSIONED FABRIC STRUCTURE
4.103 BAGGAGE HANDLING SYSTEM (BHS) , REFER TO BHS DRAWINGS
4.105 EXISTING ROOF ACCESS LADDER, PROTECT IN PLACE
4.106 EXISTING BOLLARD, PROTECT IN PLACE
4.107 EXISTING EQUIPMENT, PROTECT IN PLACE
4.108 MECHANICAL UNIT, REFER TO MECHANICAL DRAWINGS
4.109 FIRE RISER, REFER TO FIRE PROTECTION DRAWINGS
4.110 EXISTING RETAINING WALL AND FENCE, PROTECT IN PLACE
4.111 BHS IMPACT PROTECTION
4.112 BUILDING IMPACT PROTECTION
4.113 LINE OF CANOPY OVERHEAD

N 1 **FIRST FLOOR PLAN - AREA A**
1/8" = 1'-0"

KEY PLAN

Mead & Hunt
Mead & Hunt, Inc.
3110 E.Guasti Road,
Suite 330
Ontario, CA 91761
phone: 909-467-8560
meadhunt.com

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SAN LUIS OBISPO COUNTY AIRPORT
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
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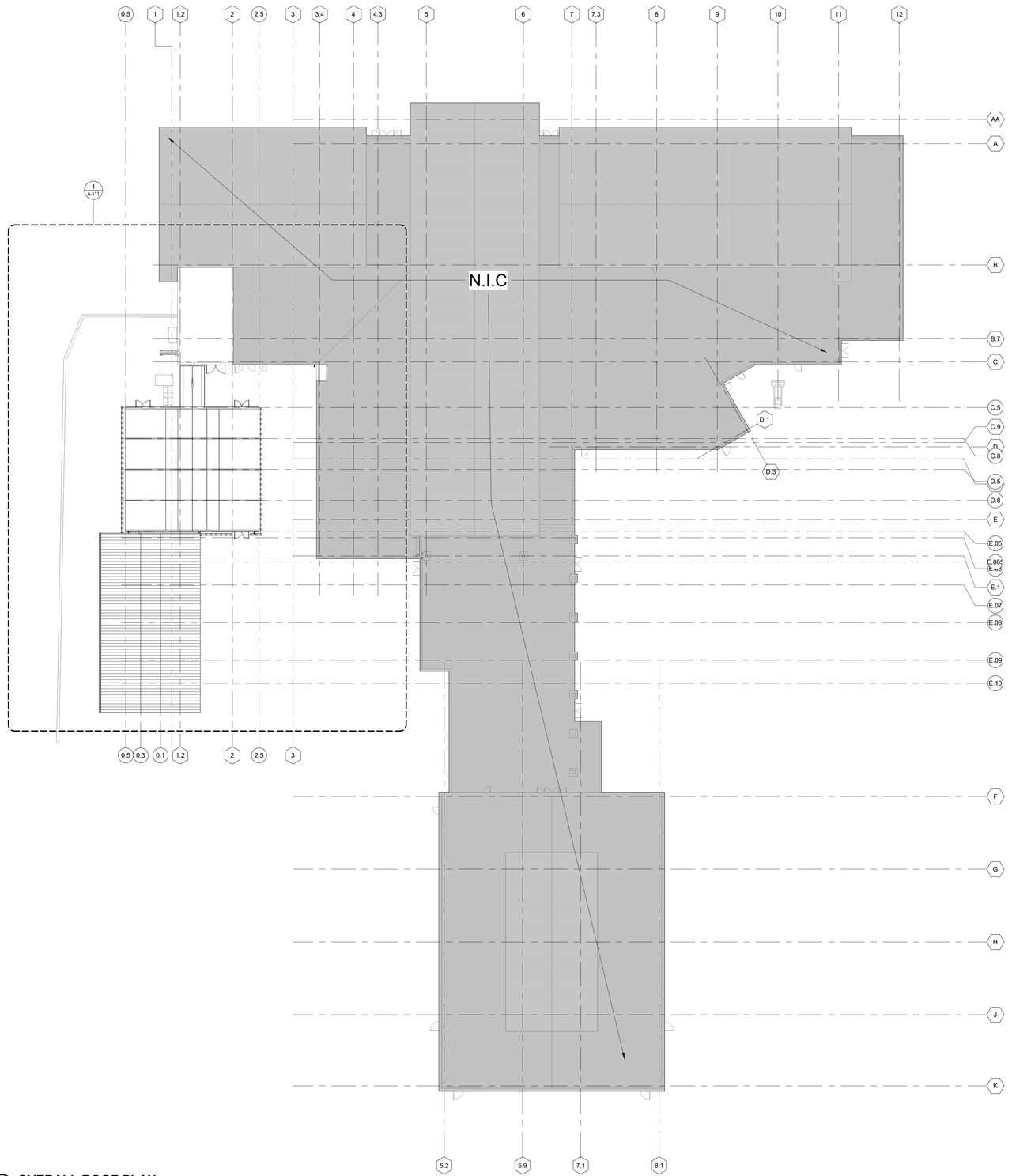
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SHEET CONTENTS
PARTIAL FIRST FLOOR PLAN

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-101

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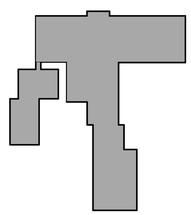


N 1 **OVERALL ROOF PLAN**
1" = 20'-0"

FLOOR PLAN GENERAL NOTES:

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON SITE PLAN = 100'-0" ON ARCHITECTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
3. ALL INTERIOR DIMENSIONS ARE FROM FINISH FACE OF WALLS (I.E. GYPSUM WALLBOARD OR CMU), UNLESS NOTED OTHERWISE.
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8. COORDINATE THE INSTALLATION OF ALL OWNER-SUPPLIED EQUIPMENT. REFERENCE PLANS, SPECS, AND INTERIOR ELEVATIONS FOR SPECIFIC EQUIPMENT AND ITS INSTALLATION REQUIREMENTS.
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10. REFERENCE G-101 FOR SEQUENCING PHASING REQUIREMENTS.

KEYED NOTES



KEY PLAN

Mead & Hunt

Mead & Hunt, Inc.
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Ontario, CA 91761
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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

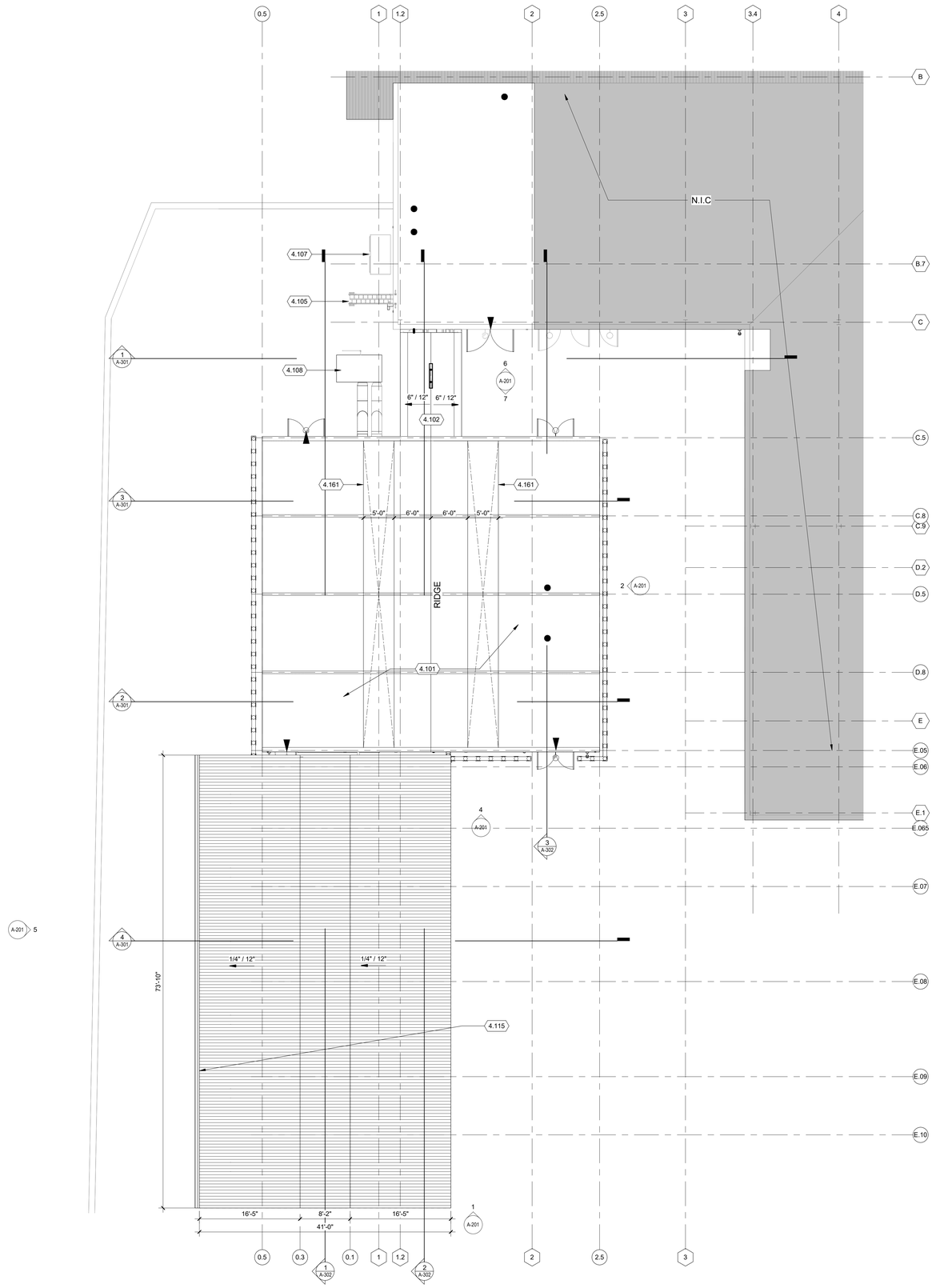
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SHEET CONTENTS
OVERALL ROOF PLAN

SHEET NO.:
A-110

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

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N 1 **ROOF PLAN - AREA A**
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES:

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON SITE PLAN = 100'-0" ON ARCHITECTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR FINAL DECISION.
3. ALL INTERIOR DIMENSIONS ARE FROM FINISH FACE OF WALLS (I.E. GYPSUM WALLBOARD OR CMU), UNLESS NOTED OTHERWISE.
4. FINISH FLOOR ELEVATIONS ARE TO THE TOP OF CONCRETE, UNLESS NOTED OTHERWISE.
5. REFERENCE SHEET G-011 AND G-021 FOR ALL CODE, FIRE RATING, AND SEPARATION REQUIREMENTS.
6. GENERAL CONTRACTOR SHALL PATCH AND REPAIR EXISTING CONSTRUCTION (WALLS, DOORS, CEILINGS, FLOORS, ETC.) AS REQUIRED FROM DEMOLITION OR CONSTRUCTION TO ALLOW FOR THE PREP WORK AND NEW OR COMPLETION OF EXISTING FINISHES. REPAIRS OR REPLACEMENTS MUST BE DURABLE, SEAMLESS, AND MATCH THE EXISTING MATERIAL.
7. GENERAL CONTRACTOR SHALL PATCH ALL FLOOR AND WALL PENETRATIONS CAUSED BY DEMOLITION OF MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING, INCLUDING BUT NOT LIMITED TO PIPING AND CONDUIT RUNS, IN A MANNER THAT IS CONSISTENT WITH THE EXISTING FLOOR AND WALL CONSTRUCTION AND FINISH. ALL PENETRATIONS SHALL MEET REQUIRED FIRE RATINGS.
8. COORDINATE THE INSTALLATION OF ALL OWNER-SUPPLIED EQUIPMENT. REFERENCE PLANS, SPECS, AND INTERIOR ELEVATIONS FOR SPECIFIC EQUIPMENT AND ITS INSTALLATION REQUIREMENTS.
9. GENERAL CONTRACTOR SHALL PROVIDE BLOCKING, STIFFENERS, BRACINGS, BACKING PLATES, SUPPORTING BRACKETS, AND NECESSARY SELECTIVE DEMOLITION REQUIRED FOR THE PROPER INSTALLATION OF ALL CASEWORK, TOILET ROOM ACCESSORIES, TOILET PARTITIONS AND MISCELLANEOUS EQUIPMENT.
10. REFERENCE G-101 FOR SEQUENCING PHASING REQUIREMENTS.

KEYED NOTES

4.101 TENSIONED FABRIC STRUCTURE

4.102 TENSIONED FABRIC CONNECTOR

4.105 EXISTING ROOF ACCESS LADDER, PROTECT IN PLACE

4.107 EXISTING EQUIPMENT, PROTECT IN PLACE

4.108 MECHANICAL UNIT, REFER TO MECHANICAL DRAWINGS

4.115 INTEGRALLY SLOPED GUTTER

4.161 DAYLIGHT PANELS SEE RCP

KEY PLAN

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

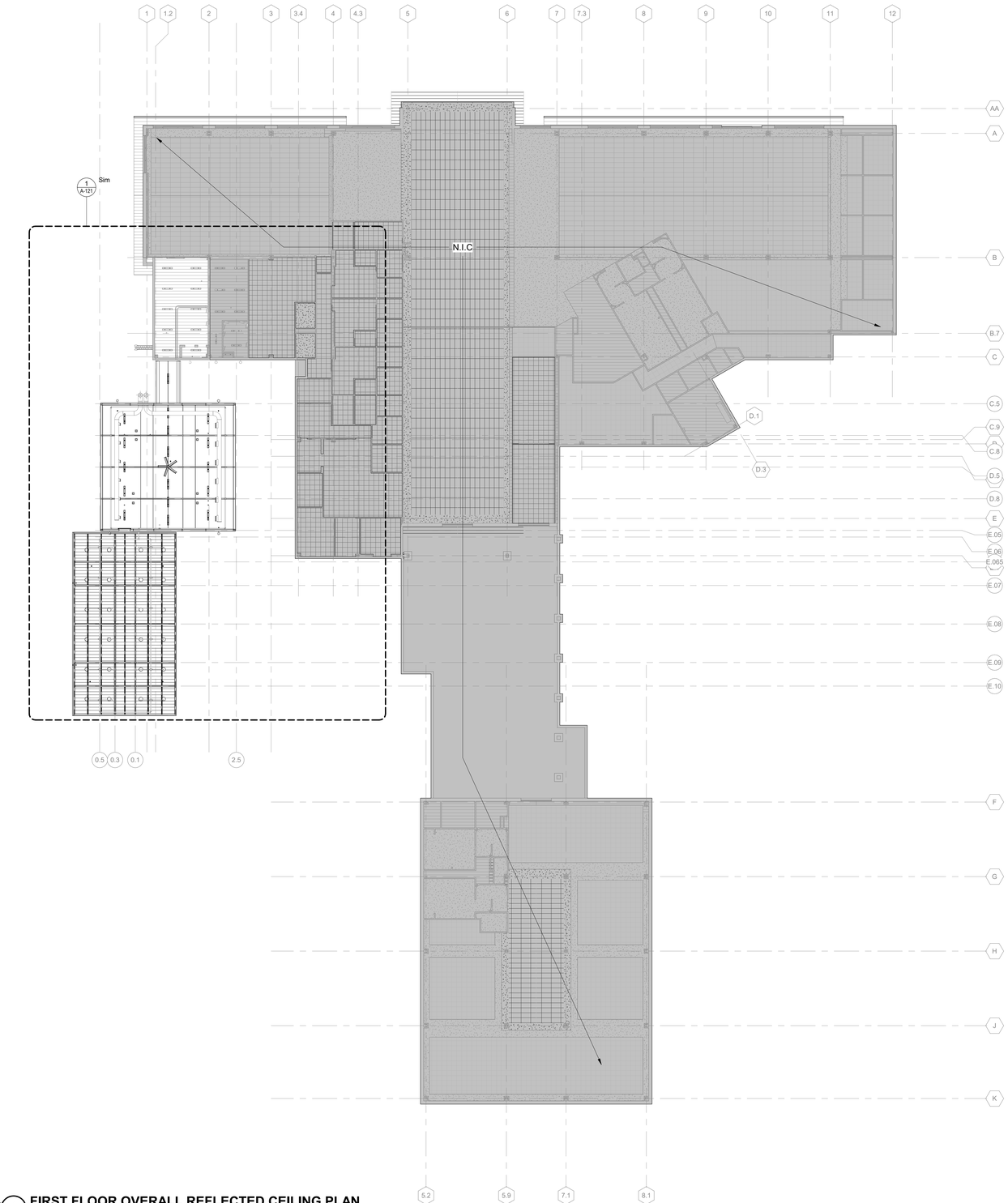
M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
DO NOT SCALE DRAWINGS

SHEET CONTENTS
PARTIAL ROOF PLAN

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
STATE OF
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-111

1/21/2026 3:30:30 PM C:\Revit Local\222814.02-A-R24_Marco.PineCQ2GU.rvt



N 1 **FIRST FLOOR OVERALL REFLECTED CEILING PLAN**
1" = 20'-0"

CEILING PLAN GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT FOR FINAL DECISION.

CEILING PLAN LEGEND:

SEE ELECTRICAL FOR EXACT FIXTURE MODEL

- LIGHT FIXTURE (SUSPENDED)
- LIGHT FIXTURE (SUSPENDED)
- CEILING SPEAKER
- CEILING CAMERA
- SPRINKLER HEADS
- CEILING RECEPTACLES
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER / EXHAUST GRILL
- EXHAUST FAN

KEY PLAN

Mead & Hunt

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BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

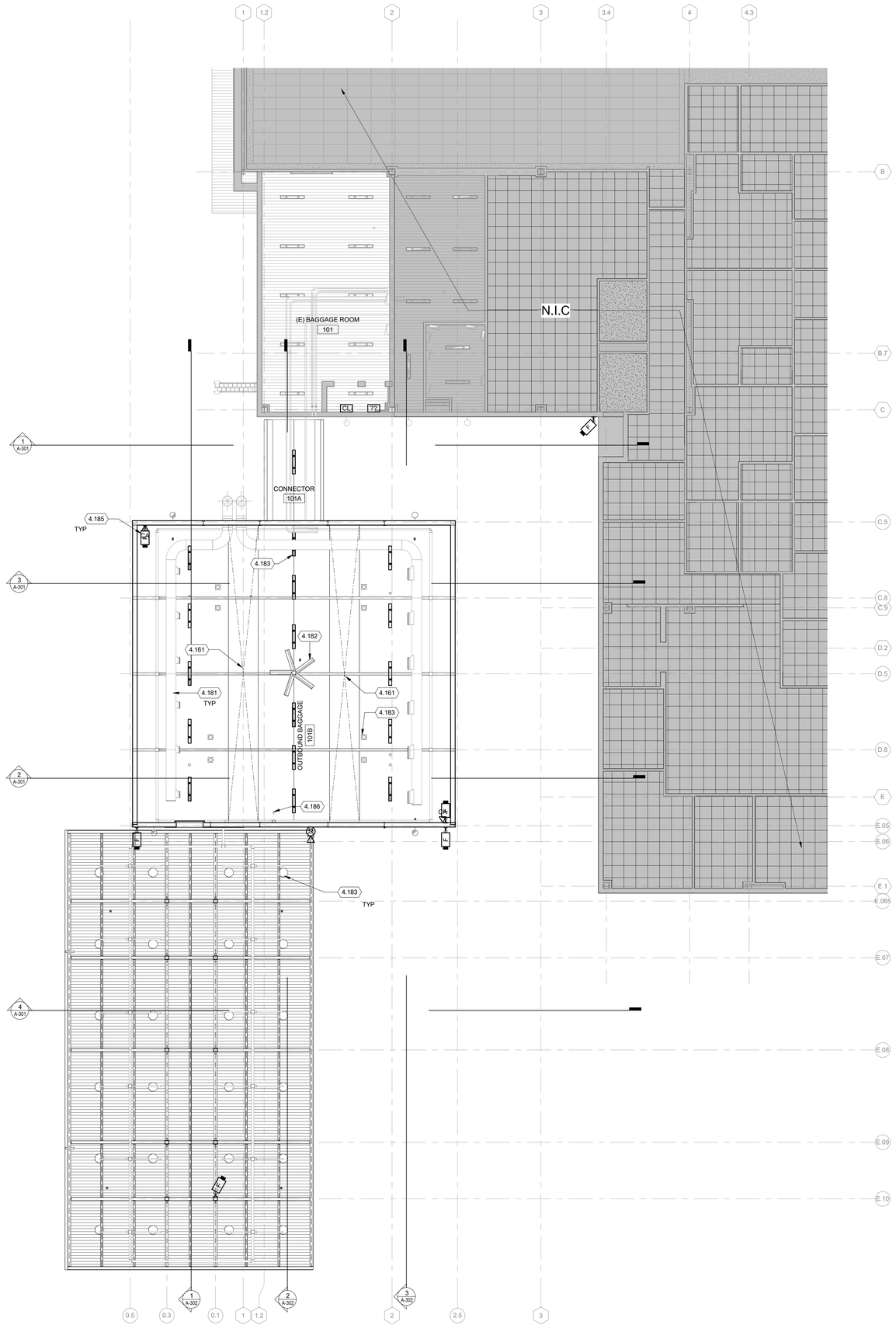
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DATE: January 28, 2026
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SHEET CONTENTS
OVERALL REFLECTED CEILING PLAN

SHEET NO.:
A-120

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEW
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

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CEILING PLAN GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT FOR FINAL DECISION.

CEILING PLAN LEGEND:

SEE ELECTRICAL FOR EXACT FIXTURE MODEL

- LIGHT FIXTURE (SUSPENDED)
- LIGHT FIXTURE (SUSPENDED)
- CEILING SPEAKER
- CEILING CAMERA
- SPRINKLER HEADS
- CEILING RECEPTACLES
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER / EXHAUST GRILL
- EXHAUST FAN

KEYED NOTES

4.161 DAYLIGHT PANELS SEE RCP

4.181 MECHANICAL DUCT RE: MECHANICAL

4.182 FAN, RE: MECHANICAL

4.183 LIGHT FIXTURE RE: ELECTRICAL

4.185 SECURITY CAMERA RE: TECHNOLOGY

4.186 FIRE SPRINKLER RISER RE: FIRE PROTECTION

N 1 PARTIAL REFLECTED CEILING PLAN

1/8" = 1'-0"

KEY PLAN

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BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

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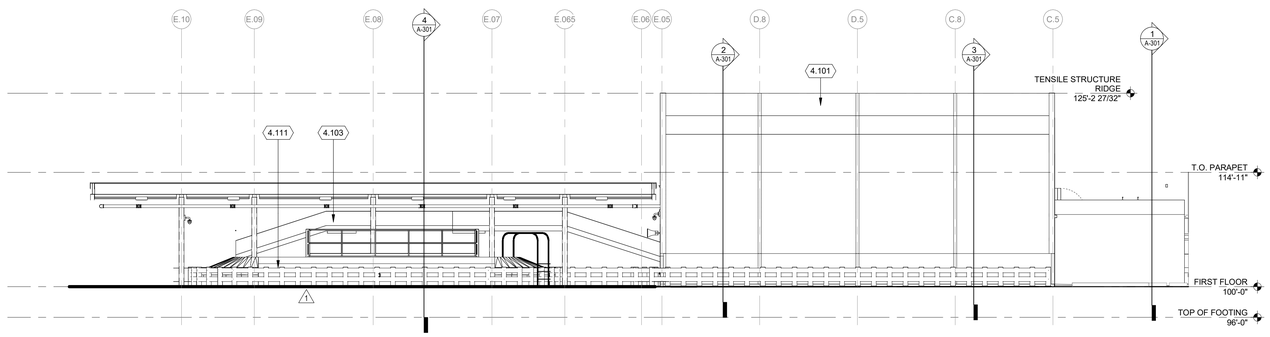
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SHEET CONTENTS
PARTIAL REFLECTED CEILING PLAN

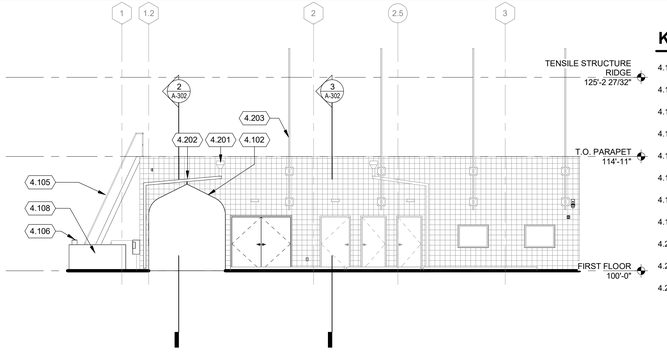
LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-121

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2 SPRUNG STRUCTURE - ELEVATION EAST
1/8" = 1'-0"

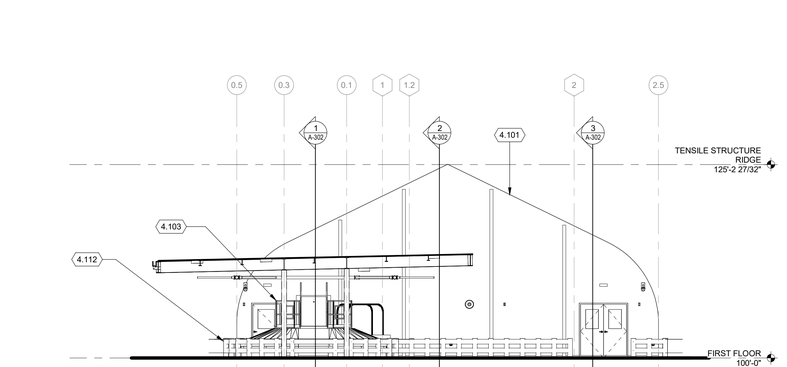


6 TERMINAL ELEVATION SOUTH
1/8" = 1'-0"

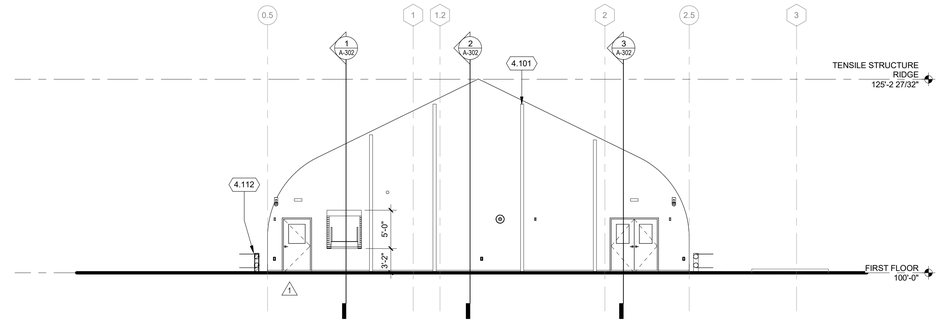
KEYED NOTES

4.101	TENSIONED FABRIC STRUCTURE
4.102	TENSIONED FABRIC CONNECTOR
4.103	BAGGAGE HANDLING SYSTEM (BHS) , REFER TO BHS DRAWINGS
4.105	EXISTING ROOF ACCESS LADDER, PROTECT IN PLACE
4.106	EXISTING BOLLARD, PROTECT IN PLACE
4.108	MECHANICAL UNIT, REFER TO MECHANICAL DRAWINGS
4.111	BHS IMPACT PROTECTION
4.112	BUILDING IMPACT PROTECTION
4.201	EXISTING SCUPPER AND DOWNSPOUT
4.202	NEW DOWNSPOUT ROUTING, CONNECT TO EXISTING SCUPPER
4.203	EXISTING ANTENNA MASTS TYP.

5 SPRUNG STRUCTURE - ELEVATION WEST
1/8" = 1'-0"



7 SPRUNG STRUCTURE - ELEVATION NORTH
1/8" = 1'-0"



4 SPRUNG STRUCTURE - ELEVATION SOUTH
1/8" = 1'-0"

1 SPRUNG STRUCTURE EXTERIOR ELEVATION SOUTH
1/8" = 1'-0"

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

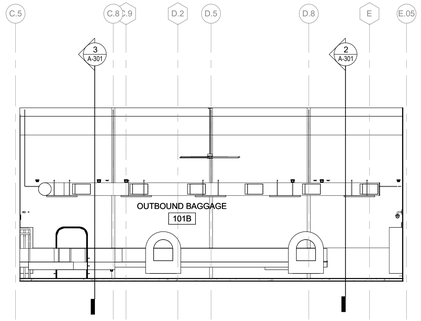
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DATE: January 28, 2026
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DRAWN BY: DA
CHECKED BY: JC
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SHEET CONTENTS
EXTERIOR ELEVATIONS

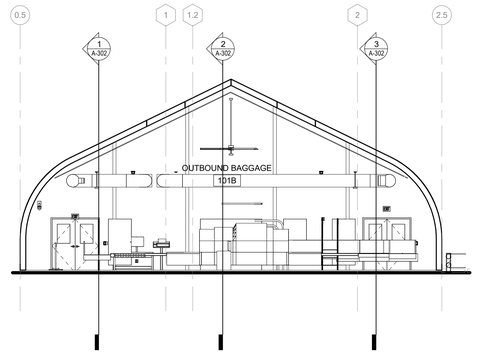
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LIC. # 35197
STATE OF
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

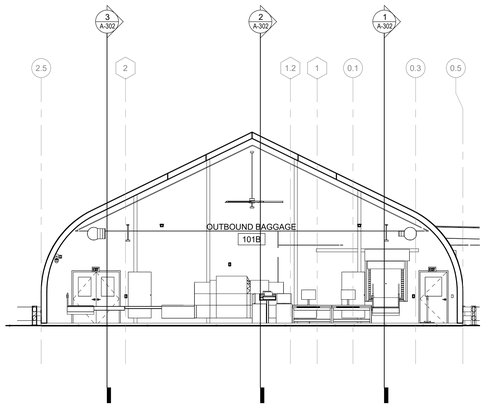
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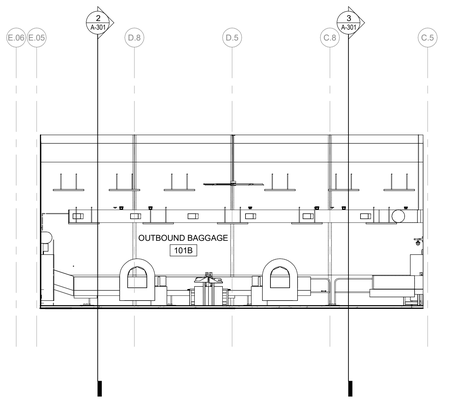
3 EAST SPRUNG STRUCTURE INTERIOR ELEVATION
1/8" = 1'-0"



1 NORTH SPRUNG STRUCTURE INTERIOR ELEVATION
1/8" = 1'-0"



4 SOUTH SPRUNG STRUCTURE INTERIOR ELEVATION
1/8" = 1'-0"



2 WEST SPRUNG STRUCTURE INTERIOR ELEVATION
1/8" = 1'-0"

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

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1	09/30/25	PERMIT REVISIONS
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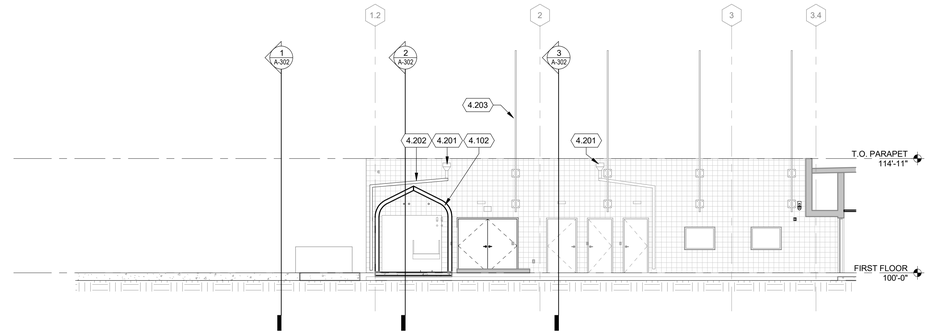
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SHEET CONTENTS
INTERIOR BUILDING ELEVATIONS

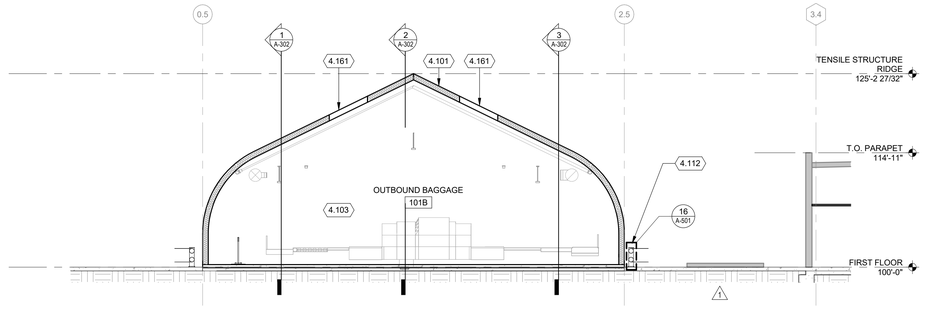
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LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-211

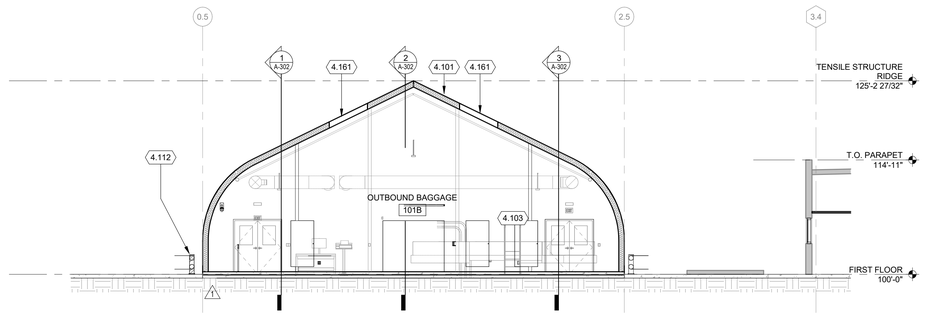
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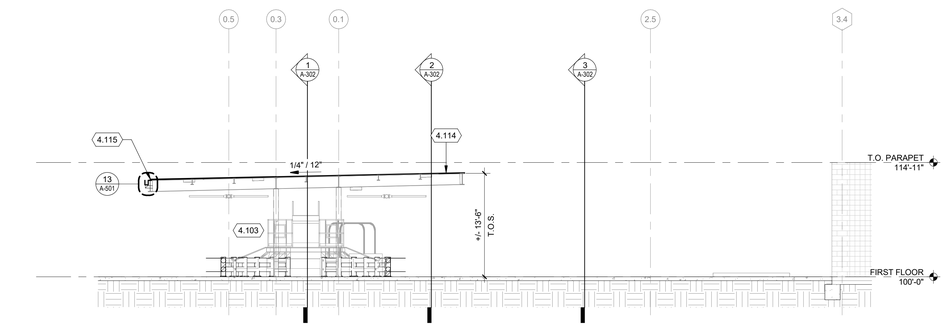
1 BUILDING SECTION - CONNECTOR
1/8" = 1'-0"



2 BUILDING SECTION - SPRUNG STRUCTURE
1/8" = 1'-0"



3 BUILDING SECTION - SPRUNG STRUCTURE
1/8" = 1'-0"



4 BUILDING SECTION - CANOPY
1/8" = 1'-0"

KEYED NOTES

4.101	TENSIONED FABRIC STRUCTURE
4.102	TENSIONED FABRIC CONNECTOR
4.103	BAGGAGE HANDLING SYSTEM (BHS) , REFER TO BHS DRAWINGS
4.112	BUILDING IMPACT PROTECTION
4.114	CANOPY
4.115	INTEGRALLY SLOPED GUTTER
4.161	DAYLIGHT PANELS SEE RCP
4.201	EXISTING SCUPPER AND DOWNSPOUT
4.202	NEW DOWNSPOUT ROUTING, CONNECT TO EXISTING SCUPPER
4.203	EXISTING ANTENNA MASTS TYP.

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BAGGAGE SCREENING SYSTEM

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SAN LUIS OBISPO, CA 93401

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M&H NO.: 1943000-222814.02
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SHEET CONTENTS
BUILDING SECTIONS

LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SHEET NO.:
A-301

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KEYED NOTES

4.101 TENSIONED FABRIC STRUCTURE

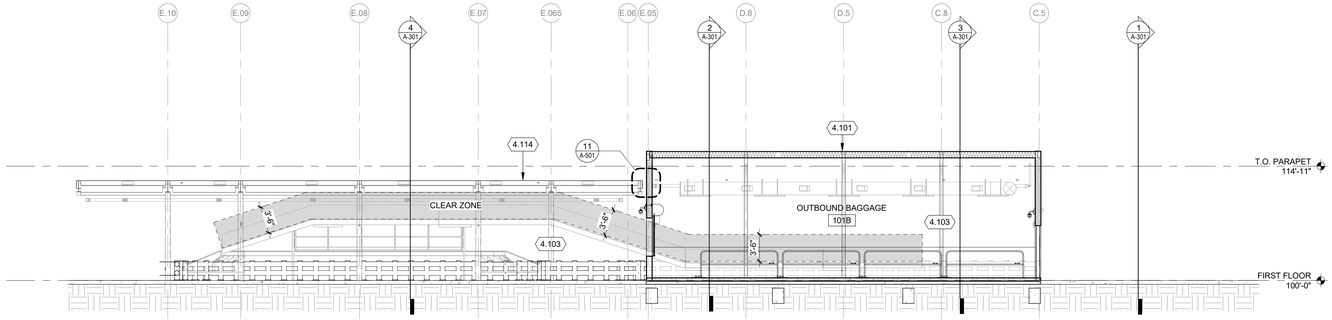
4.102 TENSIONED FABRIC CONNECTOR

4.103 BAGGAGE HANDLING SYSTEM (BHS) , REFER TO BHS DRAWINGS

4.105 EXISTING ROOF ACCESS LADDER, PROTECT IN PLACE

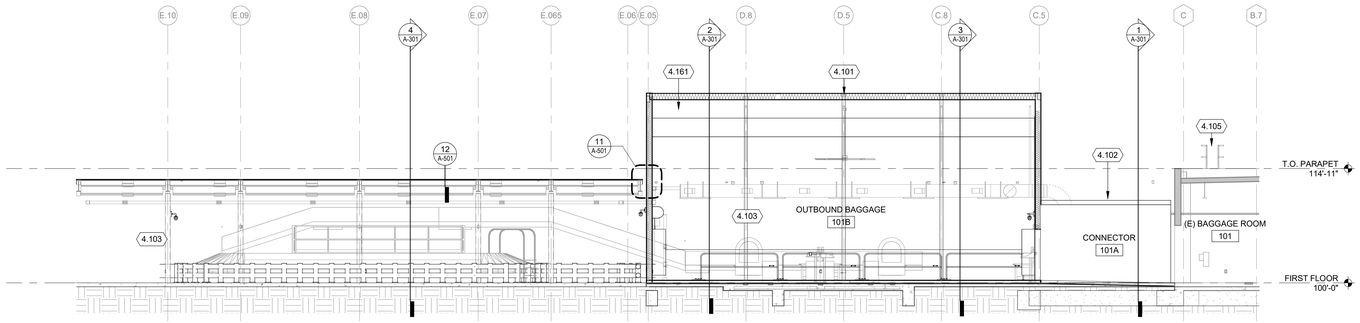
4.114 CANOPY

4.161 DAYLIGHT PANELS SEE RCP



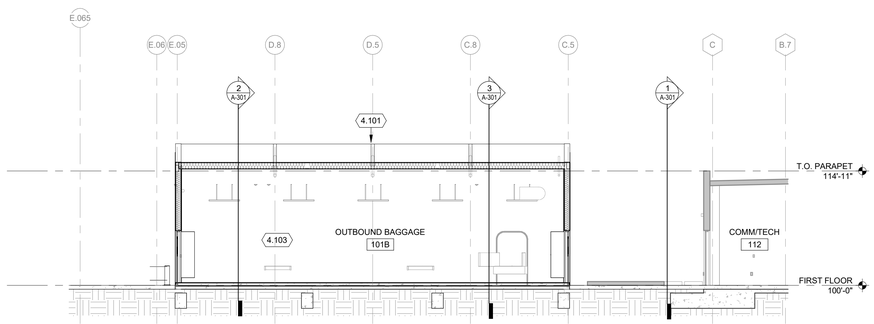
1 BUILDING SECTION - N/S - 1

1/8" = 1'-0"



2 BUILDIGN SECTION - N/S - 2

1/8" = 1'-0"



3 BUILDING SECTION - N/S - 3

1/8" = 1'-0"

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

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2	01/28/26	PERMIT REVISIONS

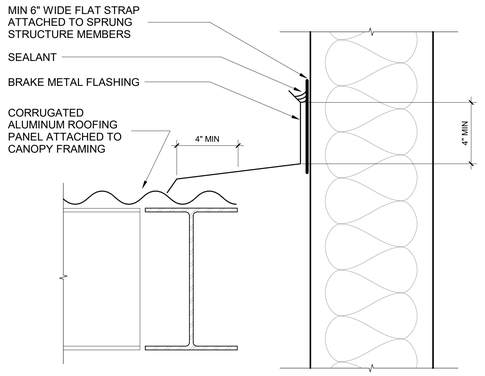
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DESIGNED BY: DA
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SHEET CONTENTS
BUILDING SECTIONS

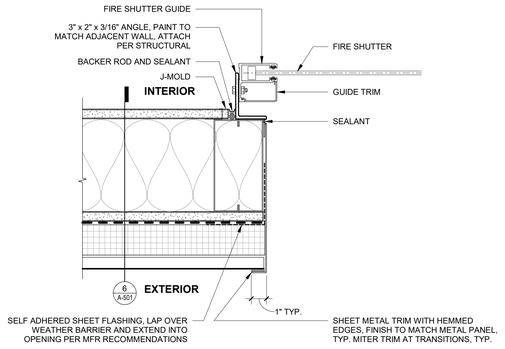
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LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
STATE OF
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NOVEMBER 30, 2027
STATE OF CALIFORNIA

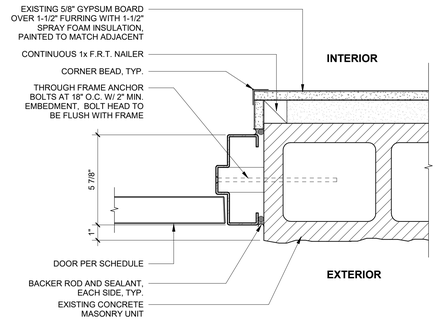
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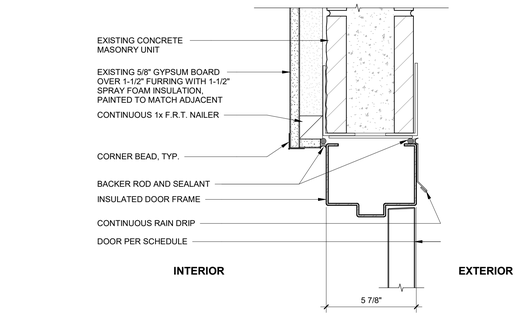
11 FLASHING BETWEEN SPRUNG STRUCTURE AND CANOPY
3" = 1'-0"



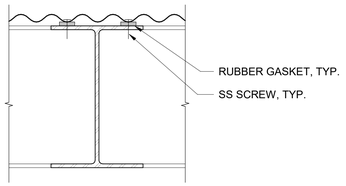
8 SHUTTER JAMB
3" = 1'-0"



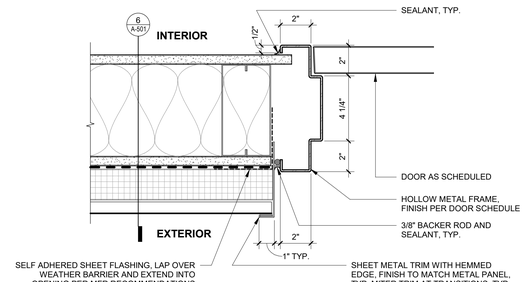
4 HM DOOR JAMB AT CMU
3" = 1'-0"



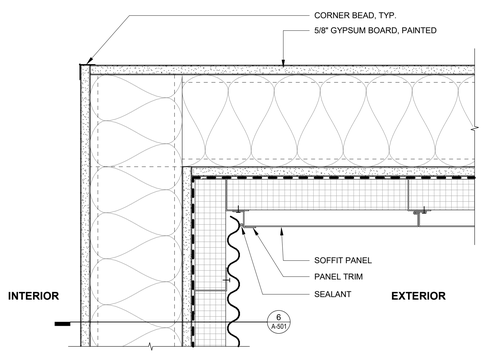
1 HM DOOR HEAD AT CMU
3" = 1'-0"



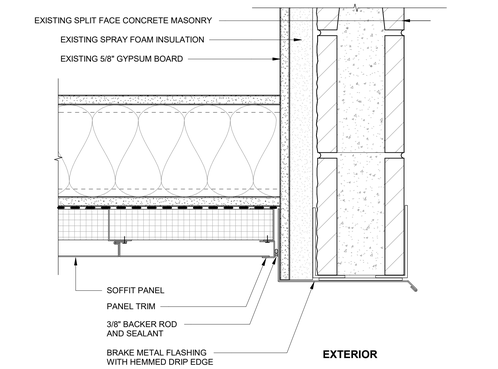
12 CANOPY ROOFING ASSEMBLY
3" = 1'-0"



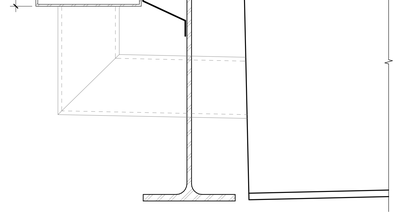
9 HM DOOR JAMB AT TEMP. EXTERIOR WALL
3" = 1'-0"



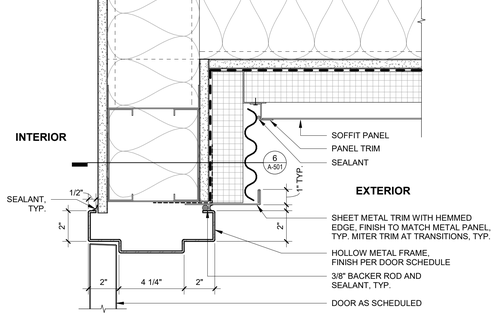
5 EXTERIOR SOFFIT AT TEMP. EXTERIOR WALL
3" = 1'-0"



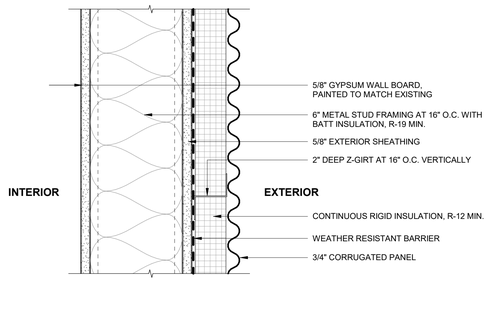
2 EXTERIOR SOFFIT AT EXISTING EXTERIOR WALL
3" = 1'-0"



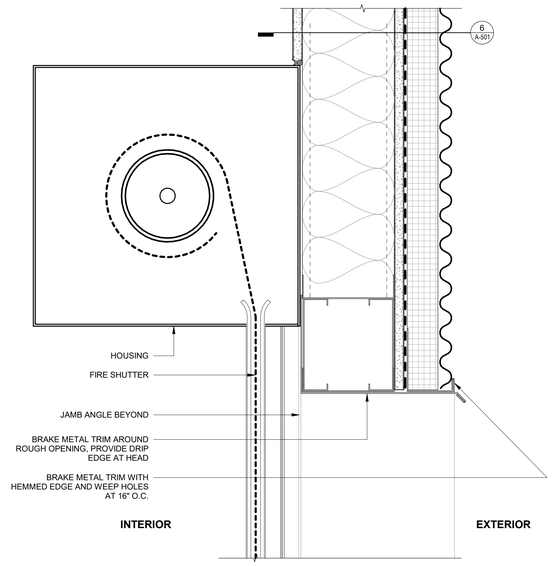
13 DOWNSPOUT ATTACHMENT
3" = 1'-0"



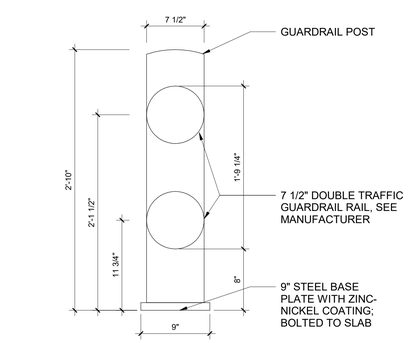
10 HM DOOR HEAD AT TEMP. EXTERIOR WALL
3" = 1'-0"



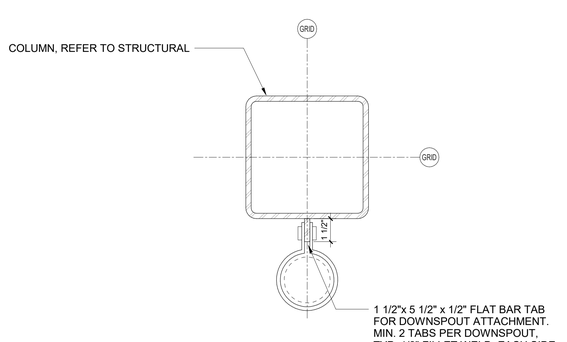
6 TEMP. EXTERIOR WALL ASSEMBLY
3" = 1'-0"



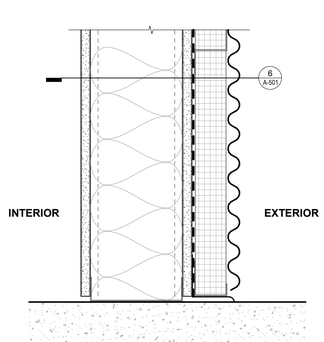
3 FIRE SHUTTER HEAD AT TEMP. EXTERIOR WALL
3" = 1'-0"



16 DOUBLE TRAFFIC GUARDRAIL
1 1/2" = 1'-0"



14 GUTTER PLAN CONNECTION
3" = 1'-0"



7 TEMP. EXTERIOR WALL - BASE
3" = 1'-0"

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SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS
2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: DA
DRAWN BY: DA
CHECKED BY: JC
DO NOT SCALE DRAWINGS

SHEET CONTENTS
DETAILS



SHEET NO.:
A-501

1/21/2026 3:30:38 PM C:\Revit Local\222814-02-A-R24_Marco Pino\CQGU.rvt

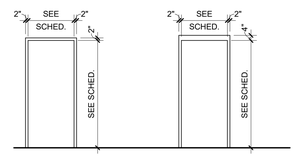
DOOR AND HARDWARE SCHEDULE

DOOR NUMBER	DOOR							FRAME					MISCELLANEOUS	REMARKS
	LEAF SIZE					GLAZING TYPE	FINISH	TYPE	MAT'L	DETAILS		FINISH	HDWR SET	
	QTY.	WIDTH	HEIGHT	TYPE	MAT'L					HEAD	JAMB			
101D.1	-	4'-0"	4'-0"	FC	ST	-	EX.	EX	ST				REFER TO BHS	EXISTING, SALVAGED AND RELOCATED FIRE SHUTTER
101E	1	3'-0"	7'-0"	F	HCI	-	PT-1	F1	HM	10/A-501	9/A-501	PT-1		
101F	(2)	3'-10"	7'-0"	F	HCI	-	PT-1	F2	HM	1/A-501	4/A-501	PT-1		
101G	(2)	3'-0"	7'-0"	HG	HCI	IN	PT-2	F1	HM	-	-	PT-2	SEE REMARKS	DOOR, FRAME AND HARDWARE BY TENSIONED FABRIC STRUCTURE MANUFACTURER
101H	(2)	3'-0"	7'-0"	HG	HCI	IN	PT-2	F1	HM	-	-	PT-2	SEE REMARKS	DOOR, FRAME AND HARDWARE BY TENSIONED FABRIC STRUCTURE MANUFACTURER
101J	(2)	3'-0"	7'-0"	HG	HCI	IN	PT-2	F1	HM	-	-	PT-2	SEE REMARKS	DOOR, FRAME AND HARDWARE BY TENSIONED FABRIC STRUCTURE MANUFACTURER
101K	-	4'-6"	5'-0"	RC	SS	-	FF	-	SS				REFER TO BHS	REFER TO BHS DRAWINGS
101L	1	3'-6"	7'-0"	HG	HCI	IN	PT-2	F1	HM	-	-	PT-2	SEE REMARKS	DOOR, FRAME AND HARDWARE BY TENSIONED FABRIC STRUCTURE MANUFACTURER

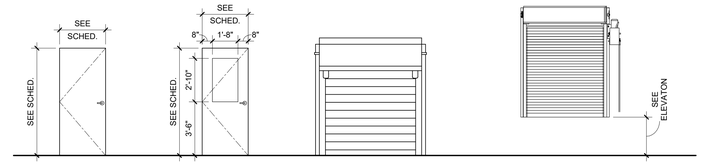
DOOR AND HARDWARE SCHEDULE ABBREVIATIONS

DOOR/FRAME MATERIALS
- AL = ALUMINUM
- EX = EXISTING
- G = GALVANIZED
- HCI = INSULATED CORE
- HM = HOLLOW METAL
- PT-1 = PAINTED TO MATCH EXISTING HM DOORS
- PT-2 = PAINTED AS SELECTED BY ARCHITECT FROM MFRS STANDARD COLORS
- RC = ROLL-UP (COILING)
- SS = STAINLESS STEEL
- ST = STEEL

GLAZING TYPES
- E = EXISTING
- IN = INSULATED
- S = SAFETY
- T = TEMPERED



FRAME TYPES
1/4" = 1'-0"



DOOR TYPES
1/4" = 1'-0"

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LICENCED ARCHITECT
TIMOTHY R DACEY
LIC. # 35197
RENEWAL DATE
NOVEMBER 30, 2027
STATE OF CALIFORNIA

SAN LUIS OBISPO COUNTY AIRPORT (SBP)
BAGGAGE SCREENING SYSTEM

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

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M&H NO.: 1943000-222814.02
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SHEET CONTENTS
DOOR SCHEDULES

SHEET NO.:
A-601

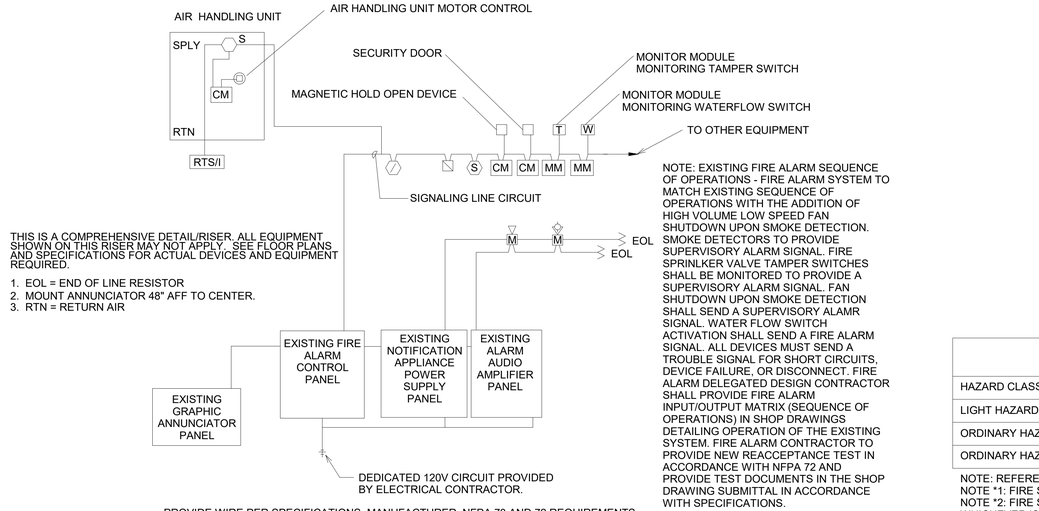
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ACOUSTICALLY DISTINGUISHABLE SPACE (ADS) TABLE

ADS #	INTERIOR NORMALLY OCCUPIED AREA	INTERIOR ABSORBATIVE FINISHES	INTERIOR NORMALLY UNOCCUPIED AREA	INTERIOR REVERBERANT FINISH OR CAVERNOUS LIKE AREA	EXTERIOR TRANSIENTLY OCCUPIED AREA	VISUAL NOTIFICATION	AUDIBLE AND VISIBLE NOTIFICATION	AUDIBILITY	VOICE INTELLIGIBILITY	NO AUDIBLE OR VISIBLE NOTIFICATION
ADS #01	X	X					X	X	X	
ADS #02	X			X			X	X		
ADS #03			X			X				
ADS #04	X	X				X				
ADS #05			X	X			X	X		
ADS #06			X	X						X
ADS #07					X		X	X	X	

GENERAL NOTE: THE INTENT OF THIS TABLE IS TO PROVIDE INFORMATION TO THE DELEGATED DESIGN CONTRACTOR FOR DESIGN INTENT. ABSORBATIVE OR REVERBERANT MATERIALS ARE NOT SPECIFICALLY IDENTIFIED BUT MAY HAVE AN IMPACT ON INTELLIGIBILITY. REVIEW ALL CONTRACT DOCUMENTS INCLUDING INTERIOR AND ARCHITECTURAL SHEETS FOR ADDITIONAL INFORMATION.

5 ACOUSTICALLY DISTINGUISHABLE SPACE TABLE
NO SCALE



THIS IS A COMPREHENSIVE DETAIL/RISER. ALL EQUIPMENT SHOWN ON THIS RISER MAY NOT APPLY. SEE FLOOR PLANS AND SPECIFICATIONS FOR ACTUAL DEVICES AND EQUIPMENT REQUIRED.

1. EOL = END OF LINE RESISTOR
2. MOUNT ANNUNCIATOR 48" AFF TO CENTER.
3. RTN = RETURN AIR

NOTE: EXISTING FIRE ALARM SEQUENCE OF OPERATIONS - FIRE ALARM SYSTEM TO MATCH EXISTING SEQUENCE OF OPERATIONS WITH THE ADDITION OF HIGH VOLUME LOW SPEED FAN SHUTDOWN UPON SMOKE DETECTION. SMOKE DETECTORS TO PROVIDE SUPERVISORY ALARM SIGNAL. FIRE SPRINLKER VALVE TAMPER SWITCHES SHALL BE MONITORED TO PROVIDE A SUPERVISORY ALARM SIGNAL. FAN SHUTDOWN UPON SMOKE DETECTION SHALL SEND A SUPERVISORY ALAMR SIGNAL. WATER FLOW SWITCH ACTIVATION SHALL SEND A FIRE ALARM SIGNAL. ALL DEVICES MUST SEND A TROUBLE SIGNAL FOR SHORT CIRCUITS, DEVICE FAILURE, OR DISCONNECT. FIRE ALARM DELEGATED DESIGN CONTRACTOR SHALL PROVIDE FIRE ALARM INPUT/OUTPUT MATRIX (SEQUENCE OF OPERATIONS) IN SHOP DRAWINGS DETAILING OPERATION OF THE EXISTING SYSTEM. FIRE ALARM CONTRACTOR TO PROVIDE NEW REACCEPTANCE TEST IN ACCORDANCE WITH NFPA 72 AND PROVIDE TEST DOCUMENTS IN THE SHOP DRAWING SUBMITTAL IN ACCORDANCE WITH SPECIFICATIONS.

PROVIDE WIRE PER SPECIFICATIONS, MANUFACTURER, NFPA 70 AND 72 REQUIREMENTS

4 FIRE ALARM CONTROL PANEL
NO SCALE

FIRE SPRINKLER DENSITY TABLE

HAZARD CLASSIFICATION	DENSITY, GPM/SQ. FT.	DESIGN AREA, SQ. FT.	HOSE ALLOWANCE, GPM
LIGHT HAZARD	0.10	1500*1	100*2
ORDINARY HAZARD GROUP 1	0.15	1500*1	250*2
ORDINARY HAZARD GROUP 2	0.20	1500*1	250*2

NOTE: REFERENCE SPECIFICATIONS AND DRAWINGS FOR REQUIRED DENSITIES OF SPECIFIC AREAS OF THE BUILDINGS.
NOTE *1: FIRE SPRINKLER DESIGN AREA SHALL BE ADJUSTED AS REQUIRED BY NFPA 13 FOR SLOPED CEILINGS.
NOTE *2: FIRE SPRINKLER SYSTEM HOSE ALLOWANCE SHALL BE IN ACCORDANCE WITH NFPA 13 OR NFPA 415 SECTION 4.5 FIRE PROTECTION WHICHEVER IS GREATEST.

3 FIRE SPRINKLER DENSITY TABLE
NO SCALE

FIRE ALARM GENERAL NOTES:

1. REFER TO THE G SERIES DRAWINGS FOR CODE ANALYSIS PLANS, INFORMATION AND NOTES.
2. EXPAND EXISTING SYSTEM TO PROVIDE COVERAGE IN THE WORK AREAS. THE CONTRACTOR SHALL COORDINATE INTERRUPTION OF SERVICE TO EXISTING SYSTEMS WITH THE OWNER. PROVIDE WRITTEN NOTICE OF INTERRUPTION OF SERVICE TO THE OWNER AT LEAST THREE BUSINESS DAYS PRIOR TO THE PLANNED INTERRUPTION.
3. COMPONENTS AND ASSEMBLIES SHALL BE UL LISTED OR FM APPROVED FOR THEIR INTENDED APPLICATION.
4. THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND ARE INTENDED TO CONVEY OVERALL SYSTEM ARRANGEMENT AS IT PERTAINS TO THE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING A COMPLETE FIRE ALARM SYSTEM AS INDICATED IN THE DESIGN DOCUMENTS AND THE REFERENCED STANDARDS.
5. ADDITIONAL DEVICES AND PARTS BEYOND WHAT IS SHOWN ON THESE PLANS MAY BE REQUIRED. CONTRACTOR SHALL NOT USE THESE PLANS FOR DEVICE COUNTS.
6. COORDINATE WORK WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL TRADES. PROVIDE ALL OFFSETS TO AVOID INTERFERENCE WITH EQUIPMENT, PIPING, DUCTWORK, LIGHTS, CONDUIT, OR STRUCTURAL MEMBERS. SEE HVAC PLANS FOR SMOKE DAMPER LOCATIONS.
7. FIRE ALARM CABLES AND WIRING SHALL BE INSTALLED WITHIN METAL RACEWAYS. RACEWAYS SHALL BE CONCEALED WITHIN FINISHED AREAS. RACEWAYS SHALL BE PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURAL ELEMENTS. JUNCTION BOXES SHALL BE PROVIDED AND CONDUCTORS SHALL BE IDENTIFIED AT EACH JUNCTION BOX. PULL BOX, ETC. WITH APPROPRIATE INFORMATION (E.G. PANEL NUMBER, CIRCUIT NUMBER, ETC.). CONNECTIONS SHALL BE MADE WITH TERMINAL CONTACTS. WIRE NUTS SHALL NOT BE PERMITTED.
8. MOUNT ALL FIRE ALARM PULL STATIONS AT 48" FROM FINISHED FLOOR TO CENTERLINE OF DEVICE, EXCEPT WHERE OTHERWISE NOTED.
9. MOUNT ALL WALL-MOUNTED FIRE ALARM NOTIFICATION DEVICES AT 90" ABOVE FINISHED FLOOR OR 6" BELOW CEILING, WHICHEVER IS LOWER, EXCEPT WHERE OTHERWISE NOTED. HEIGHT IS MEASURED TO TOP OF DEVICE.

FIRE ALARM DEMOLITION GENERAL NOTES:

1. THE INFORMATION SHOWN IS BASED ON EXISTING DRAWINGS AND SITE OBSERVATIONS TO ASSIST CONTRACTOR IN BIDDING. THE FIRE ALARM DRAWINGS INDICATE EXISTING FIRE ALARM ITEMS TO BE REMOVED. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS. REFER TO SPECIFICATION SECTION 26 05 02 FOR ADDITIONAL REQUIREMENTS.
2. DASHED WALLS ON THE FLOOR PLANS INDICATE EXISTING WALLS BEING DEMOLISHED. REFER TO THE ARCHITECTURAL DEMOLITION PLANS FOR THE EXACT EXTENT OF WORK REQUIRED BY THIS PROJECT. REMOVE ALL DEVICES ON DASHED WALLS NOT SHOWN ON THE CONTRACT DRAWINGS.
3. FIRE ALARM ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER, IN A STORAGE AREA TO BE DESIGNATED BY THE OWNER. EQUIPMENT BEING REMOVED SHALL BE HANDLED SO AS NOT TO FURTHER REDUCE ITS VALUE TO THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.
4. WHERE FIRE ALARM DEVICES ARE BEING REMOVED, ALL ASSOCIATED CONDUIT AND WIRE BACK TO THE FIRE ALARM PANEL OR JUNCTION BOX SERVING THE DEVICE SHALL ALSO BE REMOVED. UNLESS THE CONDUIT CAN BE REUSED FOR NEW FIRE ALARM CABLING. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.
5. ALL BOXES THAT REMAIN IN PLACE IN EXISTING MASONRY WALLS THAT ARE TO REMAIN SHALL BE PROVIDED WITH A BLANK COVERPLATE.
6. ALL CONDUIT SHALL BE REMOVED WHERE WALLS ARE BEING REMOVED. WHERE CONDUIT IS IN THE CONCRETE SLAB, CUT OFF FLUSH, PULL OUT WIRE, AND PLUG. WHERE CONDUIT IS RUN EXPOSED, ALL ASSOCIATED CLAMPS, SUPPORTS, HANGERS, ETC., SHALL ALSO BE REMOVED. CONDUIT CONCEALED IN WALL CONSTRUCTION MAY BE ABANDONED IN PLACE IF NOT AFFECTED BY OTHER CONSTRUCTION.
7. THIS CONTRACTOR SHALL COORDINATE ALL WORK, INCLUDING PHASING WITH OTHER CONTRACTORS AT THE JOB SITE BEFORE REMOVING EXISTING FIRE ALARM DEVICES AND INSTALLING NEW ITEMS.
8. EXISTING CONDUIT IN GOOD CONDITION, MAY BE REUSED IN PLACE. RELOCATED EXISTING CONDUIT SHALL NOT BE ALLOWED.
9. MAINTAIN OPERATION OF THE FIRE ALARM SYSTEM IN LOCATIONS OUTSIDE OF CONSTRUCTION AREA. DEVICE AND EQUIPMENT REMOVAL IN CERTAIN LOCATIONS MAY REQUIRE TEMPORARY CONNECTIONS PRIOR TO THE FINAL CONFIGURATION. FIRE ALARM SYSTEM OUTAGES SHALL BE COORDINATED WITH THE OWNER IN WRITING AT LEAST THREE BUSINESS DAYS PRIOR TO THE PLANNED FIRE ALARM SYSTEM OUTAGE.
10. CONTRACTOR SHALL REMOVE AND INSTALL ALL CEILING TILES AS REQUIRED FOR THE EXECUTION OF FIRE ALARM WORK THAT IS OUTSIDE THE CONTRACT LIMITS OF CONSTRUCTION. CONTRACTOR SHALL REPLACE CEILING TILES WITH IDENTICAL MATERIAL WHERE DAMAGED BY THIS CONTRACTOR.

FIRE ALARM SYMBOLS

FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FSS	FIRE SUPPRESSION SYSTEM PANEL
KNOX	CABINET FOR HOLDING FIRE DEPARTMENT DOCUMENTS & KEYS WITH INTEGRAL TAMPER SWITCH. KNOX BRAND # 4400 OR APPROVED EQUAL. SEE DRAWING ##.
	FIRE ALARM PULL STATION
H	FIRE ALARM HORN
S	FIRE ALARM SPEAKER
## H	FIRE ALARM HORN/STROBE, (##) IS CANDELA RATING
## S	FIRE ALARM SPEAKER/STROBE, (##) IS CANDELA RATING
S	SUPERVISED FIRE ALARM HORN LOUDSPEAKER
##	FIRE ALARM STROBE, (##) IS CANDELA RATING
B	FIRE ALARM BELL
Z	INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR
Z ER	INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR FOR ELEVATOR RECALL
Z SD	INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR FOR SMOKE DAMPER CONTROL
H	INTELLIGENT 135°F FIXED & RATE OF RISE HEAT DETECTOR (15°F/M), (20°F/M), UNLESS NOTED ON DRAWINGS
HF	HEAT DETECTOR, [190], [194] OR [200]°F FIXED TEMP 2 WIRE OPERATION. [PROVIDE ADDRESSABLE CONTROL MODULE]
HX	EXPLOSION PROOF HEAT DETECTOR, COMBINATION RATE OF RISE AND 135°F FIXED TEMPERATURE, 2-WIRE OPERATION. [PROVIDE ADDRESSABLE CONTROL MODULE.] HAZARDOUS CLASSIFICATION: [CLASS-I], [CLASS-II], [GROUP C], [GROUP D], [GROUP E], [GROUP F], AND [GROUP G].
DS	INTELLIGENT PHOTOELECTRIC DUCT SMOKE DETECTOR
CO	CARBON MONOXIDE DETECTOR
##	CEILING MOUNTED FIRE ALARM STROBE, (##) IS CANDELA RATING
##	CEILING MOUNTED FIRE ALARM SPEAKER/STROBE, (##) IS CANDELA RATING
	CEILING MOUNTED FIRE ALARM SPEAKER
##	CEILING MOUNTED FIRE ALARM HORN/STROBE, (##) IS CANDELA RATING
	CEILING MOUNTED FIRE ALARM HORN
MM	MONITOR MODULE
CM	CONTROL MODULE
IM	ISOLATOR MODULE
DH	MAGNETIC DOOR HOLDER
ES	ELECTRIC DOOR STRIKE
	FIRE FIGHTERS TELEPHONE
	FIRE FIGHTERS TELEPHONE JACK
FS	FLOW SWITCH FOR SPRINKLER SYSTEM SUPERVISORY FLOW ALARM, NORMALLY OPEN DRY CONTACTS FOR FIRE ALARM INTERFACE, FURNISHED BY MC, WIRED BY EC.
TS	MONITOR SWITCH (TAMPER SWITCH) FOR SPRINKLER SYSTEM SUPERVISORY TROUBLE NOTIFICATION, NORMALLY OPEN DRY CONTACTS FOR FIRE ALARM INTERFACE, FURNISHED BY MC, WIRED BY EC.
PE	PRESSURE SWITCH
PS	PRE-ACTION SOLENOID
RTS/I	REMOTE TEST SWITCH WITH INDICATOR
PM	POST INDICATOR SWITCH (PROVIDE ADDRESSABLE CONTROL MODULE).
HDS	ELEVATOR HOISTWAY DAMPER SWITCH
HA	HALON AUDIBLE ALARM
HP	FIRE HALON PULL STATION
HS	HALON STROBE
NAC	FIRE ALARM NOTIFICATION APPLIANCE EXTENDER PANEL

FIRE HYDRANT FLOW TEST - FIRE FLOW

DATE: 05/21/2024
TIME: 10:11 AM
LOCATION: SAN LUIS OBISPO AIRPORT
WITNESS, COMPANY: RYAN MUTHANA, PFC

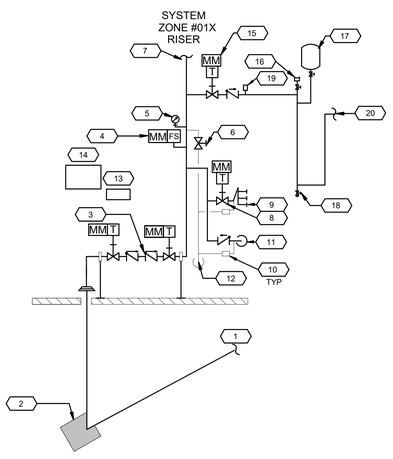
STATIC PRESSURE: 48 PSI
RESIDUAL PRESSURE: 20 PSI
FLOW RATE: 1951 GPM

NOTE: FIRE SPRINKLER DELEGATED DESIGN AND INSTALLATION CONTRACTOR SHALL CONDUCT A SEPARATE FLOW TEST IN ACCORDANCE WITH NFPA 291. THE INSTALLATING CONTRACTOR SHALL USE THE RESULTS TO DEVELOP THE HYDRAULIC CALCULATIONS TO SIZE ALL PIPING.

2 FIRE SPRINKLER AND FIRE ALARM DRAWINGS REQUIRE SEPARATE PERMIT.

RISER SCHEMATIC KEYED NOTES:

1. NEW 6" UNDERGROUND FIRE SERVICE MAIN. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
2. PROVIDE THRUST BLOCK FOR UNDERGROUND PIPING FOR TURN IN DIRECTION. DESIGN AND SIZE BLOCK SIZED IN ACCORDANCE WITH NFPA 24.
3. NEW 6" REDUCED PRESSURE ZONE BACKFLOW PREVENTION ASSEMBLY (RPZ). SHALL BE LISTED FOR INSTALLATION IN A HORIZONTAL ORIENTATION.
4. SUPERVISED WATERFLOW SWITCH
5. PRESSURE GAUGE
6. COMBINATION TEST & DRAIN VALVE WITH PRESSURE RELIEF VALVE.
7. TO WET PIPE SPRINKLER SYSTEM. PROVIDE SEISMIC BRACING OF RISER PIPING IN ACCORDANCE WITH NFPA 13.
8. PROVIDE BACKFLOW PREVENTER TEST HEADER ISOLATION VALVE SUPERVISED NORMALLY CLOSED
9. FORWARD FLOW TEST CONNECTION INSTALLED AT 48" ABOVE FINISHED GRADE. PROVIDE 2-1/2" HOSE VALVES TO PROVIDE FULL FLOW OF THE FIRE SPRINKLER SYSTEM DEMAND. ROUTE PIPING THROUGH THE EXTERIOR WALL AND SURFACE MOUNT 2-1/2" HOSE CONNECTIONS. COORDINATE PENETRATIONS WITH MEMBRANE MANUFACTURER AND SEAL IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS. PROVIDEBALL DRIP VALVE WITH PIPING CONNECTED TO MAIN DRAIN PIPING.
10. BALL DRIP VALVE
11. PROVIDE 2-1/2" SIAMESE WYE FDC SURFACE MOUNTED ON EXTERIOR WALL. INSTALL FDC AT 36" ABOVE FINISHED GRADE. PROVIDE CHECK VALVE AND BALL DRIP VALVE IN LINE WITH FDC PIPING AND CONNECT THE BALL DRIP VALVE PIPING TO THE MAIN DRAIN PIPE. MOUNT FDC TO PIPE STAND WITH PIPE CLAMPS FOR RIGIDITY.
12. 2" MAIN DRAIN ROUTED THROUGH EXTERIOR WALL. DISCHARGE DRAIN PIPE ONTO CONCRETE OR SPLASH BLOCK. INSTALL A MAXIMUM OF 18" ABOVE FINISHED GRADE. PROVIDE 30 DEGREE ELBOW TURNED DOWN ON DRAIN PIPE DISCHARGE OUTLET.
13. SPARE FIRE SPRINKLER BOX
14. LAMINATED PAPER FIRE SPRINKLER ZONE MAP
15. ANTI-FREEZE SYSTEM ISOLATION VALVE SUPERVISED NORMALLY OPEN
16. ANTI-FREEZE SYSTEM FILL CUP
17. ANTI-FREEZE SYSTEM EXPANSION TANK
18. ANTI-FREEZE SYSTEM DRAIN VALVE
19. ANTI-FREEZE SYSTEM PRESSURE RELIEF VALVE
20. TO CANOPY ANTI-FREEZE SYSTEM



NOTE: DIAGRAM IS SCHEMATIC IN NATURE. FIRE SPRINKLER CONTRACTOR TO SIZE AND INSTALL ALL REQUIRED EQUIPMENT IN ACCORDANCE WITH ALL REGULATIONS AND CONTRACT DOCUMENTS.

2 FIRE SPRINKLER RISER
NO SCALE

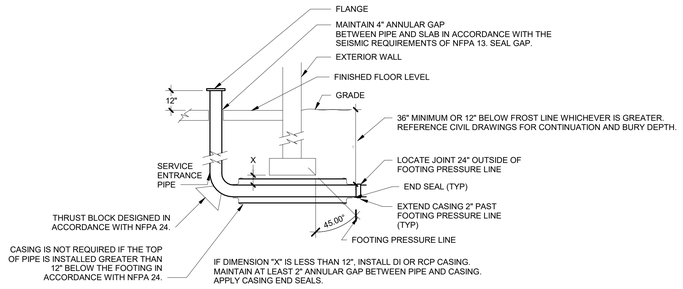


DIAGRAM IS SCHEMATIC IN NATURE. FIRE SPRINKLER CONTRACTOR TO INSTALL ALL REQUIRED EQUIPMENT IN ACCORDANCE WITH ALL REGULATIONS AND CONTRACT DOCUMENTS.

1 WATER SERVICE ENTRANCE
NO SCALE

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

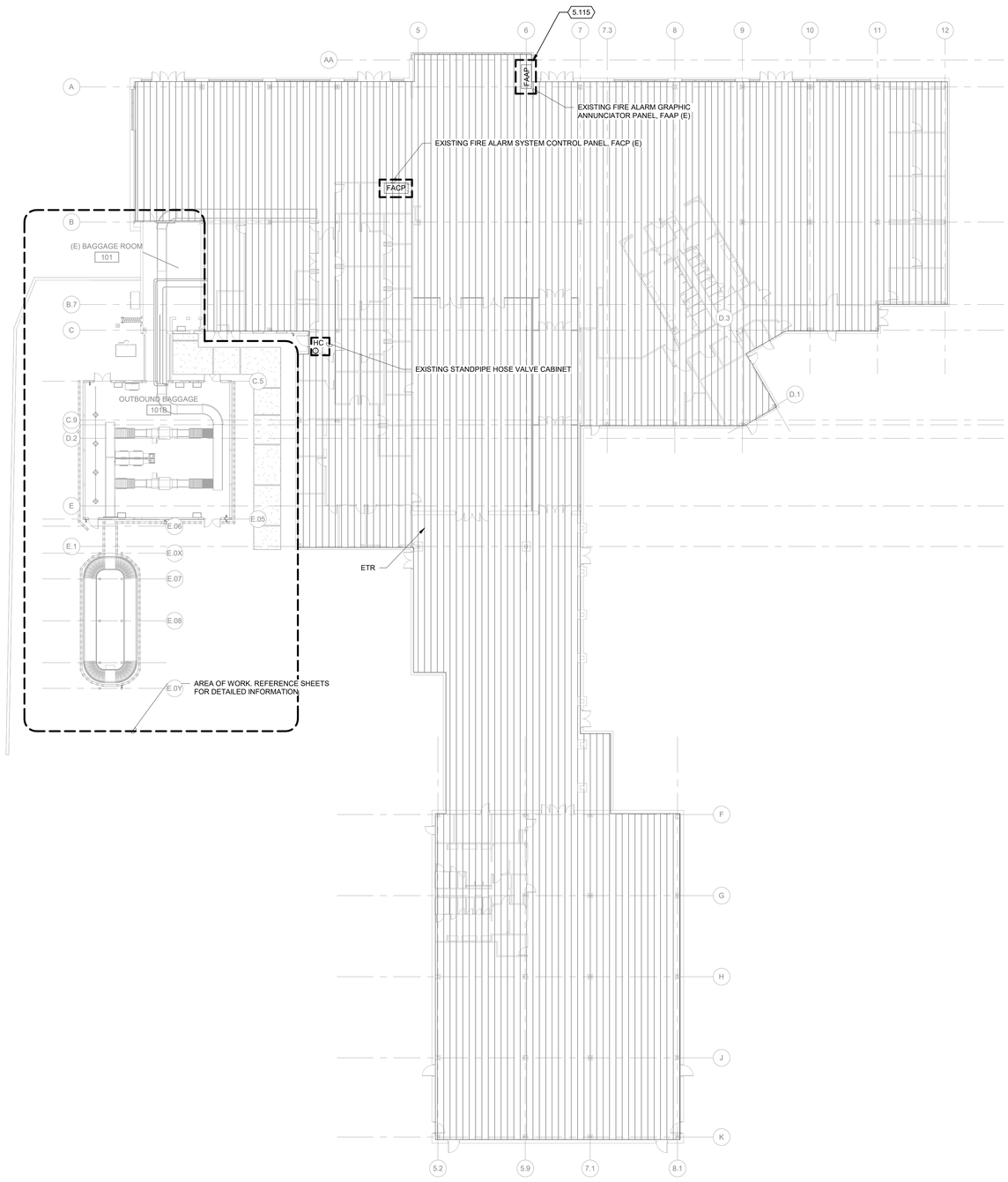
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2	01/27/26	PERMIT REVISIONS

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SHEET CONTENTS
NOTES, SYMBOLS & ABBREVIATIONS

SHEET NO.:
F-001

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1 **FIRST FLOOR OVERALL**
1" = 20'-0"

GENERAL NOTES:

1. REFER TO SHEET F-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.
2. THE MEMBRANE STRUCTURE SUPPORTS AND HANGER ATTACHMENTS ARE LIMITED TO A 300 LB POINT LOAD. SUPPORT THE FIRE SYSTEM PIPING FROM THE MEMBRANE STRUCTURE FRAME. PROVIDE MEMBRANE STRUCTURE MANUFACTURER PENDENT HANGERS AND OFFSET TYPE HANGERS TO INSTALL THE FIRE SPRINKLER SYSTEM. PROVIDE TRAPEZE HANGERS, SUSPENDED BETWEEN MANUFACTURER MEMBRANE STRUCTURE SUPPORTS UTILIZING MEMBRANE MANUFACTURER HANGERS, TO LIMIT THE POINT TO TO 300 LBS WHERE EXCEEDED. PROVIDE CALCULATIONS AND A CERTIFICATION LETTER THAT HANGER POINT LOADS DO NOT EXCEED 300 LBS WITH THE SHOP DRAWINGS.
3. ALL FIRE SPRINKLER PIPING SHALL BE SEISMICALLY BRACED IN ACCORDANCE WITH NFPA 13 TO INCLDUE BUT NOT BE LIMITED TO LATERAL, LONGITUDINAL, 4-WAY, END OF LINE RESTRAINT, BRANCH LINE RESTRAINT, PENETRATION CLEARANCE, FLEXIBLE COUPLINGS, AND FLEXIBLE SEISMIC JOINT.
4. PROVIDE EPOXY COATING OF THE EXTERIOR FIRE SPRINKLER CANOPY PIPING IN ACCORDANCE WITH DIVISION 21 SPECIFICATIONS.

KEYED NOTES

5.115 DECONSTRUCT THE EXISTING GRAPHIC ANNUNCIATOR PANEL. SHIP THE PANEL TO THE MANUFACTURER TO RECONFIGURE THE GRAPHIC ANNUNCIATOR PANEL TO SHOW A NEW UPDATED LED BACK LIT PLAN OF THE REVISED BUILDING FOOTPRINT INCLUDING THE MEMBRANE STRUCTURE AND ASSOCIATED CANOPY. PROVIDE LED BACK LIGHTING AND WIRING TO INDICATE ALL EXISTING AND NEW INITIATING DEVICE EQUIPMENT. INTERFACE NEW GRAPHIC ANNUNCIATOR PANEL AND FIRE ALARM CONTROL PANEL SO THAT WHEN AN INITIATING DEVICE SENDS AN ALARM SIGNAL THE LED ASSOCIATED WITH THAT EQUIPMENT IS LIT ON THE GRAPHIC ANNUNCIATOR PANEL FOR FIRE DEPARTMENT PERSONNEL AWARENESS.

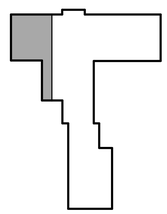
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ISSUED:
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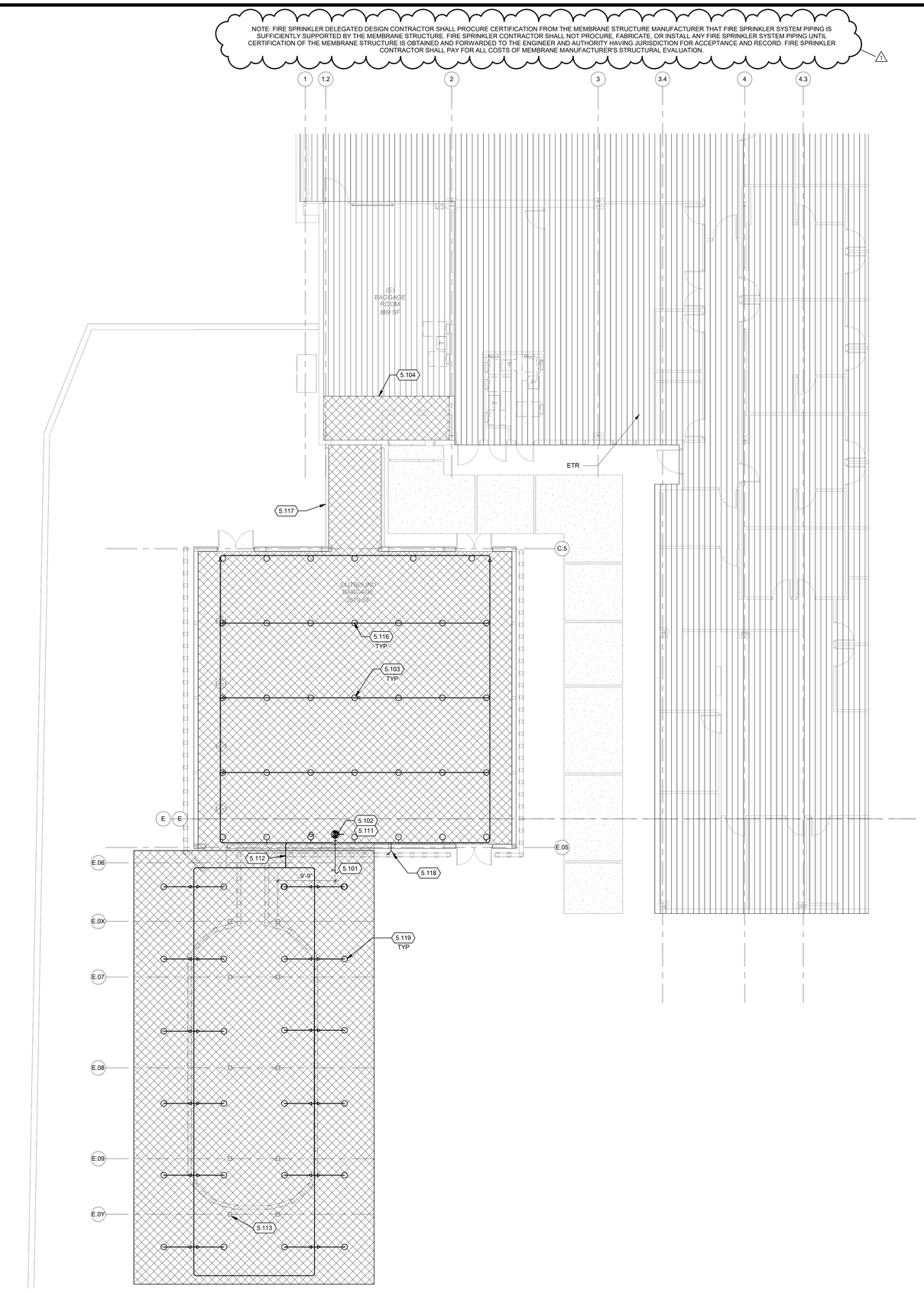
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SHEET CONTENTS
FIRST FLOOR OVERALL PLAN

SHEET NO.:
F-100

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1 **FIRE SPRINKL PLAN**
1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO SHEET F-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.
2. THE MEMBRANE STRUCTURE SUPPORTS AND HANGER ATTACHMENTS ARE LIMITED TO A 300 LB POINT LOAD. SUPPORT THE FIRE SYSTEM PIPING FROM THE MEMBRANE STRUCTURE FRAME. PROVIDE MEMBRANE STRUCTURE MANUFACTURER PENDENT HANGERS AND OFFSET TYPE HANGERS TO INSTALL THE FIRE SPRINKLER SYSTEM. PROVIDE TRAPEZE HANGERS, SUSPENDED BETWEEN MANUFACTURER MEMBRANE STRUCTURE SUPPORTS UTILIZING MEMBRANE MANUFACTURER HANGERS, TO LIMIT THE POINT TO TO 300 LBS WHERE EXCEEDED. PROVIDE CALCULATIONS AND A CERTIFICATION LETTER THAT HANGER POINT LOADS DO NOT EXCEED 300 LBS WITH THE SHOP DRAWINGS.
3. ALL FIRE SPRINKLER PIPING SHALL BE SEISMICALLY BRACED IN ACCORDANCE WITH NFPA 13 TO INCLDUE BUT NOT BE LIMITED TO LATERAL, LONGITUDINAL, 4-WAY, END OF LINE RESTRAINT, BRANCH LINE RESTRAINT, PENETRATION CLEARANCE, FLEXIBLE COUPLINGS, AND FLEXIBLE SEISMIC JOINT.
4. PROVIDE EPOXY COATING OF THE EXTERIOR FIRE SPRINKLER CANOPY PIPING IN ACCORDANCE WITH DIVISION 21 SPECIFICATIONS.

SEISMIC DESIGN GENERAL NOTES:

1. INSTALL FLEXIBLE COUPLINGS WITHIN 24 IN. OF THE TOP AND BOTTOM OF ALL FIRE SPRINKLER SYSTEM RISERS.

2. INSTALL FLEXIBLE COUPLINGS WITHIN 12 IN. ABOVE AND WITHIN 24 IN. BELOW THE FLOOR PENETRATIONS IN MULTISTORY BUILDINGS.

3. INSTALL FLEXIBLE COUPLINGS ON BOTH SIDES OF A CONCRETE OR MASONRY WALLS WITHIN 1 FT OF THE WALL SURFACE, UNLESS CLEARANCE IS PROVIDED AROUND THE ASSEMBLY IN ACCORDANCE WITH NFPA 13.

4. INSTALL FLEXIBLE COUPLINGS WITHIN 24 IN. OF BUILDING EXPANSION JOINTS.

5. INSTALL FLEXIBLE COUPLINGS WITHIN 24 IN OF THE TOP OF DROPS EXCEEDING 15 FT IN LENGTH TO PORTIONS OF SYSTEMS SUPPLYING MORE THAN ONE SPRINKLER, REGARDLESS OF PIPE SIZE.

6. INSTALL FLEXIBLE COUPLINGS FOR DROPS TO HOSE LINES, RACK SPRINKLERS, MEZZANINES, AND FREE SANDING STRUCTURES IN ACCORDANCE WITH FOLLOWING:

6a. WITHIN 24 IN OF THE TOP OF THE DROP

6b. WITHIN 24 IN. ABOVE THE UPPERMOST DROP SUPPORT ATTACHMENT, WHERE THE DROP SUPPORTS ARE PROVIDED TO THE STRUCTURE, RACK, OR MEZZANINE. 3. WITHIN 24 IN. ABOVE THE BOTTOM OF THE DROP WHERE NO ADDITIONAL DROP SUPPORT IS PROVIDED.

7. AN APPROVED SEISMIC SEPARATION ASSEMBLY SHALL BE INSTALLED WHERE SPRINKLER PIPING, REGARDLESS OF SIZE, CROSSES BUILDING SEISMIC SEPARATION JOINTS AT GROUND LEVEL AND ABOVE. INSTALL A FOUR-WAY BRACE UPSTREAM AND DOWNSTREAM WITHIN 6 FT OF THE SEISMIC SEPARATION ASSEMBLY.

8. CLEARANCE SHALL BE PROVIDED AROUND ALL PIPING EXTENDING THROUGH WALLS, FLOORS, PLATFORMS, AND FOUNDATIONS, INCLUDING DRAINS, FIRE DEPARTMENT CONNECTIONS, AND OTHER AUXILIARY PIPING IN ACCORDANCE WITH NFPA 13.

9. INSTALL ALL REQUIRED SEISMIC BRACING TO RESIST BOTH LATERAL AND LONGITUDINAL HORIZONTAL SEISMIC LOADS AND TO PREVENT VERTICAL MOTION RESULTING FROM SEISMIC LOADS. LATERAL SWAY BRACING SHALL BE PROVIDED ON ALL FEED AND CROSS MAINS REGARDLESS OF SIZE AND ALL BRANCH LINES AND OTHER PIPING WITH A DIAMETER OF 2 1/2" IN AND LARGER. WHERE BRANCH LINES ARE NOT PROVIDED WITH LATERAL SWAY BRACING, THEY SHALL BE PROVIDED WITH BRANCH LINE RESTRAINT IN ACCORDANCE WITH NFPA 13.

10. PROVIDE SEISMIC BRACING WITHIN THE 6 FEET OF THE END OF A CROSS MAIN OR FEED MAIN.

11. INSTALL A LONGITUDINAL AND LATERAL SWAY BRACE AT EACH PIPE CHANGE IN DIRECTION.

12. INSTALL END-OF-LINE BRANCH LINE RESTRAINT IN ACCORDANCE WITH NFPA 13.

13. ALL SEISMIC BRACING SHALL BE INSPECTED IN ACCORDANCE WITH THE SHOP DRAWINGS PRIOR TO THE BREAKAWAY TORQUE BOLTS BEING BROKEN OFF. CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING THAT ALL BREAKAWAY BOLTS HAVE BEEN REMOVED BY EXCEEDING THE FAILURE TORQUE OF THE BOLT. BREAKAWAY BOLTS SHALL NOT BE CUT OFF.

14. PROVIDE SEISMIC CALCULATIONS IN ACCORDANCE WITH NFPA 13 AND SPECIFICATION REQUIREMENTS.

KEYED NOTES

5.101 NEW 6" FIRE SPRINKLER SERVICE ENTRANCE. REFERENCE CIVIL DRAWING SHEET C-401 FOR CONTINUATION. INSTALL FIRE SERVICE ENTRANCE PIPING AND STUB UP INTO THE BUILDING TO AVOID THE GRADE BEAM. REFERENCE STRUCTURAL DRAWING GRADE BEAM SCHEDULES FOR GRADE BEAM DIMENSIONS AND INSTALL ENTRANCE PIPING A MINIMUM OF 12" PAST THE INTERIOR EDGE OF THE GRADE BEAM.

5.102 NEW FIRE SPRINKLER(S) SYSTEM RISER AT THIS LOCATION.

5.103 PROVIDE FIRE SPRINKLER AT THE PEAK OF THE MEMBRANE STRUCTURE.

5.104 MODIFY EXISTING FIRE SPRINKLER SYSTEM NEAR THIS AREA TO ACCOUNT FOR RECONFIGURED AREA.

5.111 PROVIDE SEISMIC BRACING AT THE TOP OF THE FIRE SPRINKLER RISER IN ACCORDANCE WITH NFPA 13. SECURE BRACE TO SUPPLEMENTAL STEEL SUPPORTS. SEE DETAIL 45 ON SHEET S-502.

5.112 PROVIDE SEISMIC EXPANSION LOOP NEAR THIS LOCATION NEAR THE SEISMIC SEPARATION BETWEEN THE CANOPY AND THE MEMBRANE STRUCTURE. SEE DETAIL 34 ON SHEET S-502 FOR SUPPLEMENTAL STEEL SUPPORT POINT.

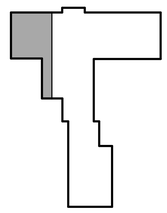
5.113 PROVIDE AUXILIARY TEST DRAIN FOR ANTI-FREEZE SYSTEM. PROVIDE QUANTITY OF TEST DRAINS IN ACCORDANCE WITH THE ANTI-FREEZE LISTING AND NFPA 13.

5.116 PROVIDE A SWING JOINT AT THE TOP OF THE MEMBRANE STRUCTURE TO CONNECT FIRE SPRINKLER SYSTEM BRANCH LINES.

5.117 PROVIDE SPRINKLER PIPING FROM THE MEMBRANE STRUCTURE OVERHEAD SYSTEM TO PROTECT THE MEMBRANE STRUCTURE CONNECTION TO THE EXISTING BUILDING.

5.118 NEW FIRE DEPARTMENT CONNECTION. SEAL PENETRATION IN ACCORDANCE WITH SPECIFICATIONS AND MEMBRANE MANUFACTURER REQUIREMENTS. MOUNT FDC A MINIMUM 36" ABOVE FINISHED GRADE. ENSURE NO OBSTRUCTION WITH BAGGAGE HANDLING SYSTEM GUARD RAIL ON SHEET QB-503.

5.119 THE CANOPY CONSTRUCTION IS CONSIDERED OBSTRUCTED CONSTRUCTION IN ACCORDANCE WITH NFPA 13. PROVIDE FIRE SPRINKLER DEFLECTORS AT AN ELEVATION IN ACCORDANCE WITH THE OBSTRUCTED CONSTRUCTION RULES TO PREVENT OBSTRUCTION TO THE FIRE SPRINKLER DISCHARGE. PROVIDE FIRE SPRINKLER HEAD GUARDS ON ALL CANOPY FIRE SPRINKLERS.



KEY PLAN

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SAN LUIS OBISPO, CA 93401

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1 09/30/25 PERMIT REVISIONS

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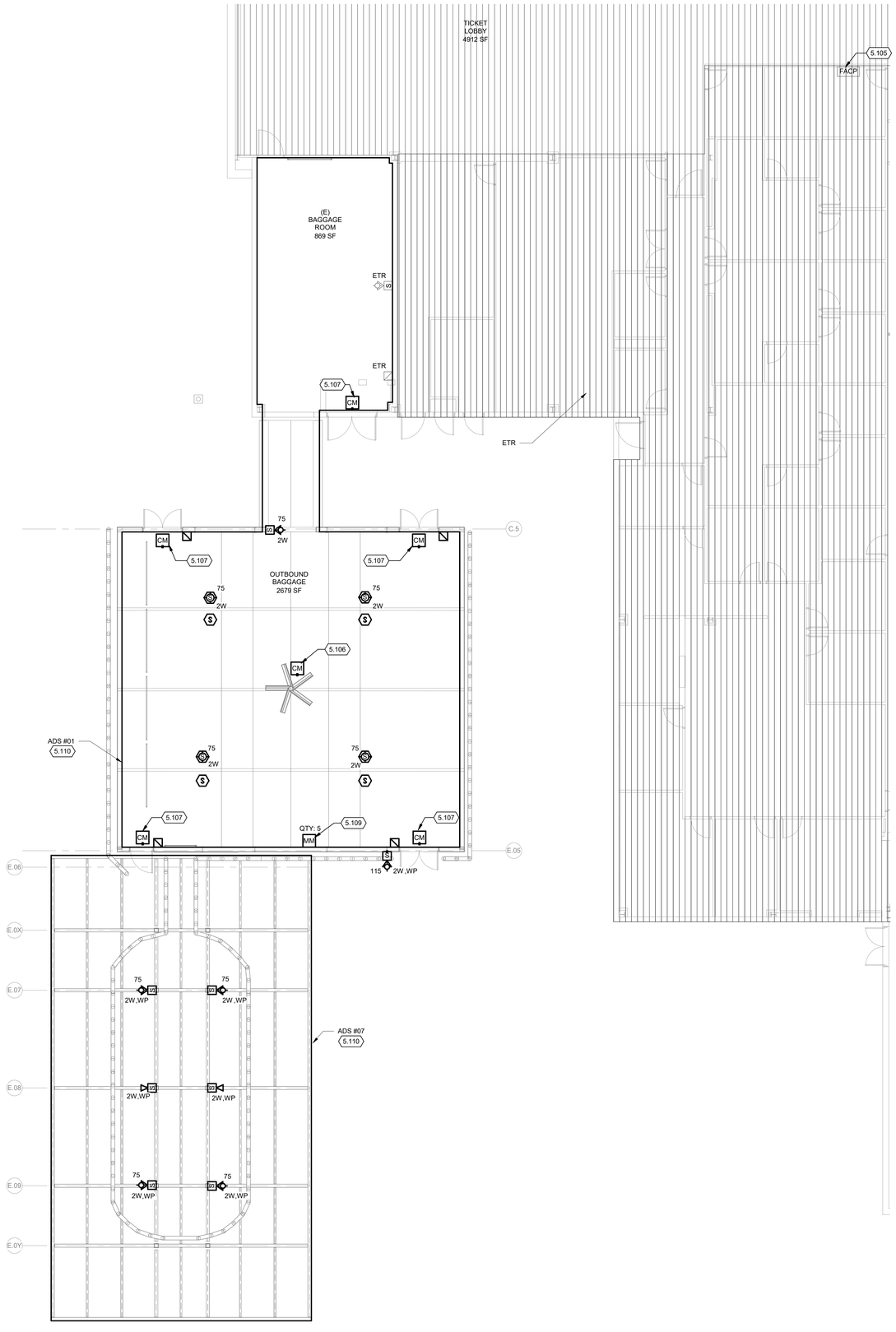
SHEET CONTENTS
FIRST FLOOR FIRE SPRINKLER PLAN

SHEET NO.:
F-102

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GENERAL NOTES:

1. REFER TO SHEET F-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.



1 **FIRE ALARM PLAN**
1/8" = 1'-0"

KEYED NOTES

5.105 EXISTING FIRE ALARM CONTROL PANEL NEAR THIS LOCATION. MODIFY EXISTING FIRE ALARM CONTROL PANEL TO EXTEND EXISTING CIRCUITS AND CONDUIT TO NEW MEMBRANE STRUCTURE NOTIFICATION APPLIANCES. PROVIDE NEW DEDICATED CIRCUITS FOR THE MEMBRANE STRUCTURE.

5.106 PROVIDE CONTROL MODULE TO SHUT DOWN HIGH VOLUME LOW SPEED FAN NEAR THIS LOCATION UPON SMOKE DETECTION AND FIRE SPRINKLER SYSTEM WATER FLOW.

5.107 PROVIDE CONTROL MODULE AND INTEGRATE SYSTEM COMPONENT WITH SECURE DOOR HARDWARE TO RELEASE THE SECURE DOOR UPON GENERAL FIRE ALARM SIGNAL.

5.109 PROVIDE MONITOR MODULES TO SUPERVISE FIRE SPRINKLER SYSTEM EQUIPMENT. REFERENCE THE DETAILS SHEET FOR QUANTITY AND LOCATION. COORDINATE WITH FIRE SPRINKLER CONTRACTOR INSTALLATION OF EQUIPMENT.

5.110 REFERENCE DETAIL SHEET FOR ACOUSTICALLY DISTINGUISHABLE SPACE (ADS) SCHEDULE.

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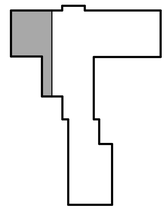
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BAGGAGE SCREENING MODS.

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SAN LUIS OBISPO, CA 93401

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SHEET CONTENTS
FIRST FLOOR FIRE ALARM PLAN

SHEET NO.:
F-141

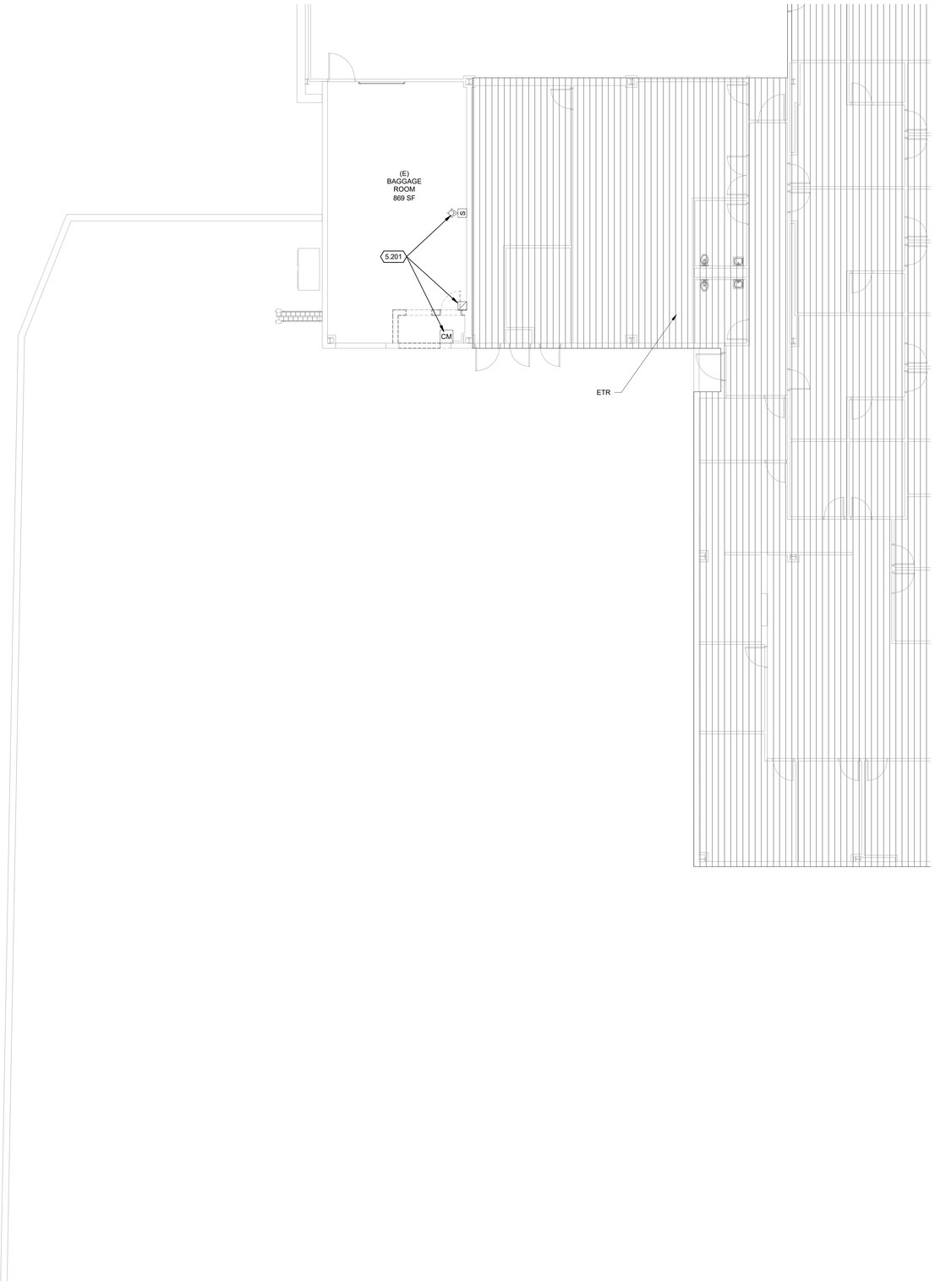
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GENERAL NOTES:

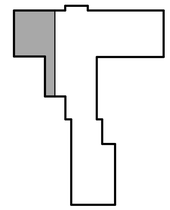
1. REFER TO SHEET F-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.

KEYED NOTES

5.201 MODIFY EXISTING SYSTEM COMPONENTS AS INDICATED ON THE DRAWINGS. RELOCATE EXISTING EQUIPMENT TO NEW AREAS INDICATED ON THE DRAWINGS OR AS REQUIRED WITHIN GENERAL AREA TO PREVENT ALL FIELD CONFLICTS DURING THE TEMPORARY PHASE OF CONSTRUCTION.



1 **FIRE ALARM TEMPORARY PLAN**
1/8" = 1'-0"



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FIRST FLOOR TEMPORARY FIRE ALARM PLAN

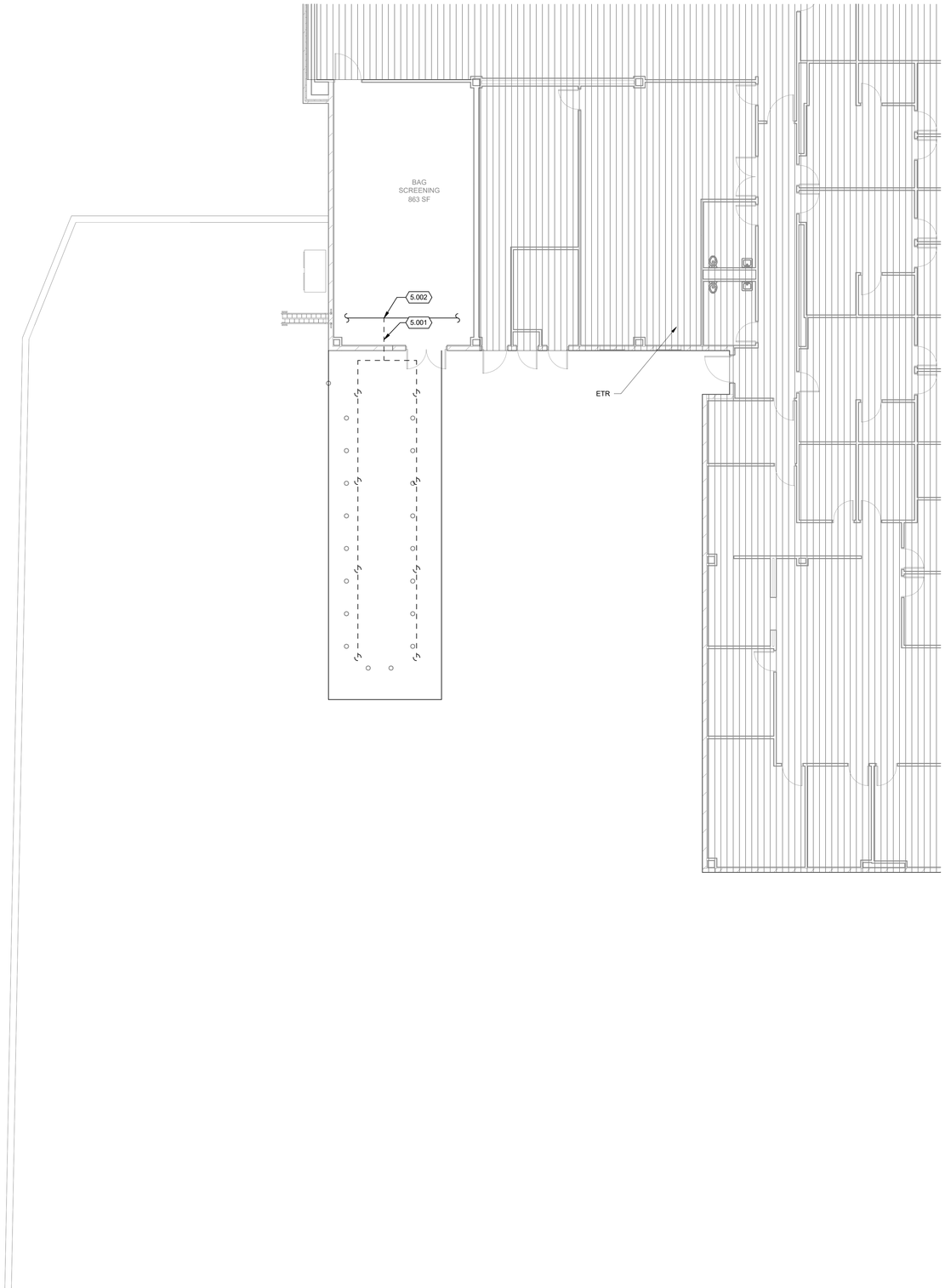
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F-142

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KEYED NOTES

5.001 DEMOLISH EXISTING FIRE SPRINKLER PIPING SUPPORTED FROM THE EXISTING CANOPY. DECONSTRUCT THE EXISTING CONNECTIONS SUPPORTING THE EXISTING SEISMIC EXPANSION LOOP FITTING. SALVAGE FITTING FOR FUTURE CONSTRUCTION PHASE.

5.002 PROVIDE GROOVED CAP WHERE THE EXISTING PIPING SUPPLYING THE CANOPY BRANCH LINES HAS BEEN DEMOLISHED.



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FIRST FLOOR FIRE SPRINKLER DEMOLITION PLAN

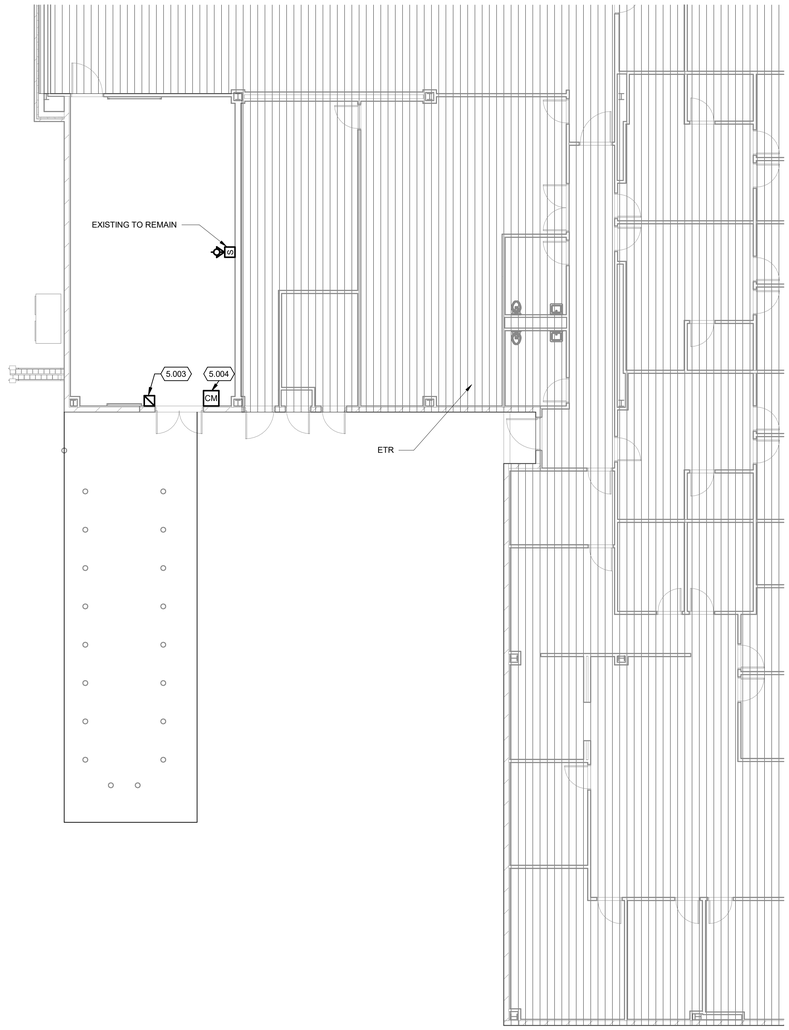
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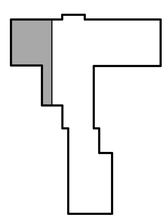
KEYED NOTES

5.003 DECONSTRUCT THE EXISTING CONDUIT, FITTINGS, AND CIRCUITS TO THE EXISTING PULL STATION. RELOCATE THE EXISTING PULL STATION TO WITHIN 5 FEET OF THE NEW EXIT DOOR FOR THE TEMPORARY PHASE OF CONSTRUCTION. PROGRAM AND PERFORM REACCEPTANCE TESTING OF THE FIRE ALARM SYSTEM FOR THE TEMPORARY PHASE OF CONSTRUCTION IN ACCORDANCE WITH NFPA 72.

5.004 DECONSTRUCT THE EXISTING CONDUIT, FITTINGS, AND CIRCUITS TO THE EXISTING CONTROL MODULE EQUIPMENT THAT IS INTEGRATED TO RELEASE THE SECURE DOORS ON FIRE ALARM. RELOCATE AND REINSTALL THE EXISTING EQUIPMENT FOR THE NEW SECURE DOOR. PROGRAM AND PERFORM REACCEPTANCE TESTING OF THE FIRE ALARM SYSTEM FOR THE TEMPORARY PHASE OF CONSTRUCTION IN ACCORDANCE WITH NFPA 72.



1 **FIRST FLOOR LIGHTING DEMO PLAN**
1/8" = 1'-0"



KEY PLAN

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FIRST FLOOR FIRE ALARM DEMOLITION PLAN

SHEET NO.:
FD141

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HVAC SYMBOLS

- AIRFLOW (SUPPLY/OUTSIDE AIR)
- AIRFLOW (RETURN/EXHAUST)
- DG — DOOR GRILLE
- SUPPLY OR OUTDOOR AIR
- RETURN OR TRANSFER
- EXHAUST
- SUPPLY DUCT TURNED AWAY
- SUPPLY DUCT TURNED TOWARD
- 12x12 — RECTANGLE DUCT SIZE (FIRST FIGURE IS SIDE SHOWN)
- 12ø — ROUND DUCT (RIGID)
- 12/12ø — OVAL DUCT (FIRST FIGURE IS SIDE SHOWN)
- DUCT (FLEXIBLE ROUND)
- TURNING VANES
- TRANSITION (SQUARE-TO-ROUND)
- S — SMOKE DETECTOR
- SECURITY BARS
- BD — BACKDRAFT DAMPER
- VOLUME DAMPER
- AD, FD — FIRE DAMPER & ACCESS DOOR
- AD, SD — SMOKE DAMPER & ACCESS DOOR
- AD, FSD — COMBINATION FIRE/SMOKE DAMPER & ACCESS DOOR
- MOD — MOTOR OPERATED CONTROL DAMPER
- AP — CEILING MOUNTED ACCESS PANEL
- XX-Y / 100 — AIR OUTLET/INLET TYPE (CFM)
- AFMS-X — AIR FLOW MEASURING STATION

MECHANICAL PIPING

- A — COMPRESSED AIR
- BFW — BOILER FEED WATER
- BSD — BOILER SURFACE BLOW DOWN
- BBD — BOILER BOTTOM BLOW DOWN
- CF — CHEMICAL FEED
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- CD — CONDENSATE DRAIN
- GWS — GLYCOL WATER SUPPLY
- GWR — GLYCOL WATER RETURN
- HPCR — HIGH PRESSURE CONDENSATE RETURN
- HPS — HIGH PRESSURE STEAM
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- IWS — ICE WATER SUPPLY
- IWR — ICE WATER RETURN
- LP — LIQUID PETROLEUM
- LPS — LOW PRESSURE STEAM
- LPCR — LOW PRESSURE CONDENSATE RETURN
- MPS — MEDIUM PRESSURE STEAM
- MPCR — MEDIUM PRESSURE CONDENSATE RETURN
- G — NATURAL GAS
- PCR — PUMPED CONDENSATE RETURN
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- RHG — REFRIGERANT HOT GAS
- SV — STEAM RELIEF VENT
- TWS — TOWER WATER SUPPLY
- TWR — TOWER WATER RETURN
- VAC — VACUUM

PIPING SYMBOLS

- PIPE TURNED TOWARD
- PIPE TURNED AWAY
- PIPE TEE TURNED AWAY
- PIPE TEE TURNED TOWARD
- FLEXIBLE CONNECTOR
- UNION
- FLANGES
- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC)
- PIPE CAP/CLEAN OUT
- PIPE PLUG
- FLUID FLOW DIRECTION
- PG — PIPE GUIDE
- PA — PIPE ANCHOR
- PITCH — PIPE PITCH DIRECTION
- PRESSURE GAUGE
- THERMOMETER
- WATER HAMMER ARRESTOR
- AV — AIR VENT (AUTO)
- MV — AIR VENT (MANUAL)
- AUTOMATIC CONTROL VALVE (2-WAY)
- AUTOMATIC CONTROL VALVE (3-WAY)
- BALL VALVE
- BALANCING VALVE
- BUTTERFLY VALVE
- BACKFLOW PREVENTION VALVE
- CHECK VALVE
- EQUIPMENT DRAIN VALVE
- FILTER
- FLOW MEASUREMENT STATION
- GATE VALVE
- GAUGE CONNECTION (TEST PLUG)
- GLOBE ANGLE VALVE
- GLOBE VALVE
- ISOLATION/SHUT-OFF/MANUAL VALVE
- PLUG VALVE
- PRESSURE REDUCING VALVE
- PRESSURE REGULATING VALVE
- RELIEF VALVE
- STEAM TRAP
- S — SOLENOID VALVE ONE-WAY (ELECTRIC)
- STRAINER
- STRAINER WITH BLOW OFF VALVE AND NIPPLE
- VACUUM BREAKER
- PUMP
- FS — FLOW SENSOR
- LS — LEVEL SENSOR
- PS — PRESSURE SENSOR
- TS — TEMPERATURE SENSOR

GENERAL SYMBOLS

- CO — CARBON MONOXIDE (CO) SENSOR
- CO2 — CARBON DIOXIDE (CO2) SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- NO2 — NITROGEN DIOXIDE (NO2) SENSOR
- RS — ROOM SENSOR
- SP — STATIC PRESSURE SENSOR
- H — HUMIDISTAT
- TS — TEMPERATURE SENSOR
- T — THERMOSTAT
- T — INSULATED BASE THERMOSTAT
- $ — SWITCH
- NEW CONNECTION TO EXISTING
- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- NEW TO BE INSTALLED

GENERAL MECHANICAL NOTES

1. THE MECHANICAL CONTRACTOR SHALL EXAMINE ALL CONTRACT DOCUMENTS AND IS REQUIRED TO DO ALL WORK WHICH IS SHOWN ON THE DRAWINGS, STATED IN THE SPECIFICATIONS, OR REASONABLY IMPLIED AS NECESSARY TO COMPLETE THEIR DIVISION OF WORK FOR THIS PROJECT REGARDLESS OF WHERE IN THE CONTRACT DOCUMENTS THE WORK IS REPRESENTED. MECHANICAL CONTRACTOR TO COORDINATE WORK WITH ALL OTHER TRADES. ALL OTHER TRADE DOCUMENTS ARE TO BE CONSIDERED PART OF THIS CONTRACTORS DOCUMENTS WITH RESPECT TO COORDINATION OF WORK BETWEEN TRADES OF WORK.
2. ABBREVIATIONS AND SYMBOLS INDICATED HERE AND NOT USED IN THE CONTRACT DOCUMENTS DO NOT APPLY TO THIS PROJECT. ADDITIONAL ABBREVIATIONS MAY BE INDICATED IN THE CONTRACT DOCUMENTS.
3. THESE DRAWINGS ARE DESIGN DRAWINGS AND ARE DIAGRAMMATIC, THEY MAY NOT SHOW ALL PHYSICAL ARRANGEMENTS, OFFSETS, BENDS, OR ELBOWS WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF VARIOUS MATERIALS, EQUIPMENT, PIPING AND DUCTWORK SYSTEMS IN ALLOTTED SPACES. EXAMINE THESE AND OTHER AVAILABLE DRAWINGS TO DETERMINE SPACE LIMITATIONS AND INTERFERENCES. MAKE ANY MINOR CHANGES IN LOCATIONS OF EQUIPMENT, PIPING, AND DUCTWORK FROM THAT SHOWN ON DRAWINGS AND FOR ALL PHYSICAL DETAILS REQUIRED FOR INSTALLATION. COST FOR ADAPTING WORK TO JOB SITE CONDITIONS SHALL NOT BE CONSIDERED AS BASIS OF AN EXTRA COST TO CONTRACT.
4. ELEVATION OF PIPING AND DUCTWORK INDICATED ON THESE DRAWINGS ARE TO BE USED AS GUIDELINES TO ASSIST WITH INSTALLATIONS. MINOR CHANGES TO THESE ELEVATIONS MAY BE NECESSARY TO ELIMINATE UNFORESEEN INTERFERENCES. ANY CHANGE IN ELEVATION SHALL BE APPROVED PRIOR TO CHANGE.
5. ANY AND ALL INFORMATION SHOWN ON THESE DRAWINGS WITH RESPECT TO EXISTING STRUCTURES, UTILITIES, AND MECHANICAL SYSTEMS, IS AS EXACT AS COULD BE SECURED. THE INFORMATION IS NOT WARRANTED NOR GUARANTEED ACCURATE, FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO PROCEEDING WITH WORK.
6. ACCURATE AND LEGIBLE AS-BUILT DRAWING MARKUPS SHALL BE MAINTAINED AT THE JOB SITE, AND BE SUBMITTED PRIOR TO FINAL PAYMENT FOR THE CREATION OF FINAL RECORD DRAWINGS.
7. ALL NEW AND EXISTING ROOFING SYSTEMS SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.
8. TEMPORARILY PATCH ALL ROOF OPENINGS WATERTIGHT UNTIL FINAL CLOSURE CAN BE MADE.
9. VERIFY ALL EQUIPMENT LOCATIONS AND PIPE AND DUCT ROUTING WITH OWNER PRIOR TO INSTALLATION.
10. SEQUENCE OF WORK AND/OR PLACE OF COMMENCEMENT OF WORK SHALL BE APPROVED PRIOR TO WORK BEING STARTED. SCHEDULED SHUTDOWNS SHALL BE CLOSELY COORDINATED WITH EXISTING OPERATIONS.
11. MAINTAIN 3'-0" CLEAR HORIZONTALLY IN FRONT OF ALL ELECTRICAL EQUIPMENT.
12. COORDINATE POWER REQUIREMENTS FOR ALL POWER TO MECHANICAL EQUIPMENT INCLUDING CONTROL SYSTEM WITH ELECTRICAL CONTRACTOR AND INSURE ALL COSTS ASSOCIATED WITH SUCH ARE INCLUDED IN THE PROJECT BID COST. PROVIDE ELECTRICAL POWER, TRANSFORMERS, RELAYS, ETC. AS NECESSARY TO ALL HVAC AND MECHANICAL CONTROLS.
13. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES ON ALL EQUIPMENT.

AIR CONDITIONING DESIGN DATA SCHEDULE

DESIGN AREA	SUMMER				WINTER			REMARKS
	OUTSIDE		INSIDE		OUTSIDE	INSIDE		
	°F (DB)	°F (WB)	°F (DB)	% HUMID	°F (DB)	°F (DB)	% HUMID	
OCCUPIED ROOMS	84.3	63.2	76.0	-	34.0	68.0	-	

ABBREVIATIONS

A	AMPS
AB	AIR BLOWDOWN
ABI	ALTERNATE BID ITEM
AC	DUCTLESS SPLIT SYSTEM
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
ACH	AIR COOLED CHILLER
ACOMP	AIR COMPRESSOR
ACU	AIR CONDITIONING UNIT
ACV	AUTOMATIC CONTROL VALVE
AD	AIR DROP
AF	AIR FILTER OR AIR FOIL
AFC	AFTER COOLER
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMD	AIR MIXING DEVICE
ANG	AIR NATIONAL GUARD
APPROX	APPROXIMATELY
AS	AIR SEPARATOR
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AT	AIR TERMINAL
AWC	ABSORPTION CHILLER
BAS	BUILDING AUTOMATION SYSTEM
BC	BOOSTER COIL
BH	BOOSTER HUMIDIFIER
BHP	BRAKE HORSEPOWER
BHR	CONTINUOUS BLOWDOWN HEAT RECOVERY SYSTEM
BI	BACKWARD INCLINED
BLD	BOILER BLOWDOWN SEPARATOR
BPD	BACKFLOW PREVENTION DEVICE
BRS	BRASS
BRZ/BZ	BRONZE
BS	BLACK (MILD) STEEL
BSB	BRANCH SELECTOR BOX
BT	BUFFER TANK
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BW	BUTTWELD
C	CONVECTOR
CA	COMBUSTION AIR
CAD	COMPRESSED AIR DRYER
CAF	COMPRESSED AIR FILTER
CC	COOLING COIL OR CONTROLS CONTRACTOR
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
COMP	COMPRESSOR
COND	CONDENSATE
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CRP	CONDENSATE RETURN PUMP
CS	CENTRIFUGAL SEPARATOR
CT	COOLING TOWER
CTCLG	CLOSE TO CEILING
CTCLM	CLOSE TO COLUMN
CTW	CLOSE TO WALL
CU	COPPER
CUH	CABINET UNIT HEATER
DAC	DOOR AIR CURTAIN
DBA	DECIBELS, BAND A
DC	DUST COLLECTOR
DCVA	DOUBLE CHECK VALVE ASSEMBLY BPD
DDC	DIRECT DIGITAL CONTROL
DDH	DESICCANT DEHUMIDIFIER
DEMO	DEMOLISH
DF	DESTRATIFICATION FAN
DFD	DIVISION OF FACILITIES DEVELOPMENT
DIA	DIAMETER
DIM	DIMENSION
DISCH	DISCHARGE
DMPR	DAMPER
DN	DOWN
DOD	DEPARTMENT OF DEFENSE
DRC	DRY COOLER
DWG	DRAWING
DX	DIRECT EXPANSION
E	EXISTING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EBH	ELECTRIC BASEBOARD HEATER
EC	EVAPORATIVE COOLER OR ELECTRICAL CONTRACTOR
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EFT	ENTERING FLUID TEMPERATURE
EG	EXHAUST GRILLE
EGLY	ETHYLENE GLYCOL
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC
EOM	END OF MAIN
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
ERV	AIR-TO-AIR HEAT EXCHANGER
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPERATURE
°F	FAHRENHEIT
FAF	FORCED AIR FURNACE
FC	FLUID COOLER
FCU	FAN COIL UNIT
FE	FUME EXTRACTOR
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FLOW METER
FOP	FUEL OIL PUMP
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FLASH TANK OR FEET
FTC	FINNED TUBE CONVECTOR
FTWC	FEET WATER COLUMN PRESSURE
GA	GAUGE
GAL	GALLON
GC	GENERAL CONTRACTOR
GFT	GLYCOL FILL TANK
GPM	GALLONS PER MINUTE
GS	GALVANIZED STEEL
H	HEIGHT
HB	HUMIDIFICATION BOILER
HC	HEATING COIL
HD	HEAD (FT)
HDB	HYDROSTATIC DESIGN BASIS
HP	HEAT PUMP OR HORSEPOWER
HPC	ERV HEAT PUMP COIL
HR	HOSE REEL
HRW	ROTARY AIR-TO-AIR EXCHANGER
HUM	HUMIDIFIER
HVLS	HIGH VOLUME LOW SPEED
HWB	HOT WATER BOILER
HX	FLUID HEAT EXCHANGER
HZ	HERTZ
IAW	IN ACCORDANCE WITH
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IFGC	INTERNATIONAL FUEL GAS CODE
IH	INTAKE HOOD
IN	INCH
INHG	INCHES MERCURY PRESSURE
INWC	INCHES WATER COLUMN PRESSURE
IR	INFRARED HEATER
KH	KITCHEN HOOD
KW	KILOWATT
L	LOUVER OR LENGTH
LAT	LEAVING AIR TEMPERATURE
LB	POUNDS
LD	LINEAR DIFFUSER
LFT	LEAVING FLUID TEMPERATURE
LPG	LIQUIFIED PETROLEUM GAS
LS	LEVEL SWITCH
LWT	LEAVING WATER TEMPERATURE
MADP	MAXIMUM ALLOWABLE DIFFERENTIAL PRESSURE
MAU	MAKE-UP AIR UNIT
MAWP	MAXIMUM ALLOWABLE WORKING PRESSURE
MAX	MAXIMUM
MBH	THOUSANDS BTU'S PER HOUR
MC	MECHANICAL CONTRACTOR OR MECHANICAL COUPLING
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MIN	MINIMUM
MMBH	MILLION BTU PER HOUR
MOCP	MINIMUM OVER CURRENT PROTECTION
MSS	MANUFACTURERS STANDARDIZATION SOCIETY
MTL	MATERIAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NH	NO-HUB
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPSH	NET POSITIVE SUCTION HEAD
NPSHA	NPSH AVAILABLE
NPSHR	NPSH REQUIRED
OA	OUTSIDE AIR
OC	ON CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
P	HYDRONIC PUMP OR PRESSURE
PC	PLUMBING CONTRACTOR
PCP	PRESSURE POWERED CONDENSATE PUMP
PD	PRESSURE DROP/DIFFERENTIAL
PG	PROPYLENE GLYCOL
PH	PHASE
PPH	POUND PER HOUR
PROP	PROPELLER
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSID	PSI DIFFERENTIAL
PSIG	PSI GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PTHP	PACKAGED TERMINAL HEAT PUMP
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RCP	RADIANT CEILING PANEL
RDH	REFRIGERATED DEHUMIDIFIER
RG	RETURN GRILLE
RH	RELIEF HOOD
RPM	REVOLUTIONS PER MINUTE
RTD	RESISTIVE THERMAL DEVICE
RTU	ROOF TOP UNIT
RZ	RADIANT FLOOR HEATING ZONE
SA	SUPPLY AIR
SAD	SOUND ATTENUATING DEVICE
SB	SECURITY BARRIER
SCFM	STANDARD CFM
SCH	SCHEDULE
SD	SLOT DIFFUSER/SOLDER
SF	STEAM FILTER OR SUPPLY FAN
SG	SUPPLY GRILLE
SHT	SHEET
SMLS	SEAMLESS
SMS	SNOW MELTING SYSTEM DISTRIBUTION MANIFOLD
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
SQ	SQUARE
SRV	SAFETY RELIEF VALVE
SS	STAINLESS STEEL
ST	STEAM TRAP
STD	STANDARD
STL	STEEL
SV	SOLVENT WELD
SW	SOCKET WELD
T	TEMPERATURE
TA	TRANSFER AIR
TCP	TEMPERATURE CONTROL PANEL
TDH	TOTAL DEVELOPED HEAD
TDS	TOTAL DISSOLVED SOLIDS
TEMP	TEMPERATURE
TG	TRANSFER GRILLE
TH	THREADED
TMC	TECHNOLOGY MANAGEMENT CENTER
TMV	THERMOSTATIC MIXING VALVE
TONR	TONS COOLING
TYP	TYPICAL
UC	UNIT COOLER
UFC	UNIFIED FACILITIES CRITERIA
UGD	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATOR OR ULTRAVIOLET
V	VOLTS
VA	VENT AIR
VER	VEHICLE EXHAUST REEL
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATORS
VLV	VALVE
VRF	VARIABLE REFRIGERANT FLOW
W	WATTS OR WIDTH
WC	WATER COLUMN
WCC	WATER COOLED CONDENSER
WCH	WATER COOLED CHILLER
WF	WATER FILTER
WIV	WATER INLET VALVE
WHA	WATER HAMMER ARRESTOR

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 Airport Dr, San Luis Obispo, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
2	01/28/26	PERMIT REVISIONS

M&H NO.: 222814.02
DATE: September 30, 2025
DESIGNED BY: KMK
DRAWN BY: KMK
CHECKED BY: ADK

DO NOT SCALE DRAWINGS

SHEET CONTENTS
NOTES, SYMBOLS AND ABBREVIATIONS

PROFESSIONAL ENGINEER — AARON D. KOOTI — M 39091 — MECHANICAL — STATE OF CALIFORNIA
1-27-2026

SHEET NO.:
M-001

1/27/2026 2:07:52 PM C:\Revit Local\222814.02-M-R24_kristoff krush.rvt

GENERAL HVAC NOTES

1. INLET DUCT SIZE TO AIR TERMINAL DEVICES SHALL BE SAME AS INLET SIZE UNLESS OTHERWISE NOTED. IF RUNOUT TO AIR TERMINAL BOX IS GREATER THAN 6 FEET IN LENGTH, SIZE RUNOUT ONE EVEN INCREMENT SIZE LARGER (MINIMUM 2" LARGER) UNLESS OTHERWISE NOTED TO WITHIN 3 FEET OF BOX BEFORE REDUCING TO BOX INLET SIZE.
2. DUCTWORK DOWNSTREAM OF AIR TERMINAL BOXES TO BE INTERNALLY LINED FOR A MINIMUM OF 6'-0" FOR SOUND ATTENUATION. OUTLET DUCT SIZES TO MATCH AIR TERMINAL BOX OUTLET UNLESS NOTED OTHERWISE.
3. PROVIDE MANUAL BALANCE DAMPER AT EACH DIFFUSER, GRILLE, AND BRANCH TAKE-OFF IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK EXCEPT KITCHEN GREASE EXHAUST DUCT. LOCATE BALANCE DAMPER AS CLOSE TO BRANCH TAKE-OFF AS POSSIBLE.
4. DUCT SIZE TO DIFFUSERS, REGISTERS, AND GRILLES SHALL BE SAME AS NECK SIZE UNLESS NOTED OR DETAILED OTHERWISE.
5. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH REFLECTED CEILING PLAN.
6. PROVIDE FLEXIBLE DUCTWORK FOR FINAL CONNECTIONS TO SUPPLY AIR DIFFUSERS UNLESS NOTED OTHERWISE ON DRAWINGS OR IN SPECIFICATIONS. FLEXIBLE DUCT SIZE SHALL BE SAME AS NECK SIZE OF DIFFUSER AND SHALL NOT EXCEED 5 FEET IN LENGTH.
7. PROVIDE PLENUM RATED INSULATION AND WIRING IN RETURN AIR CEILING PLENUM. MATERIALS WITHIN PLENUMS SHALL BE NON-COMBUSTIBLE OR SHALL HAVE A FLAME AND SMOKE SPREAD INDEX OF NOT MORE THAN 25/50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

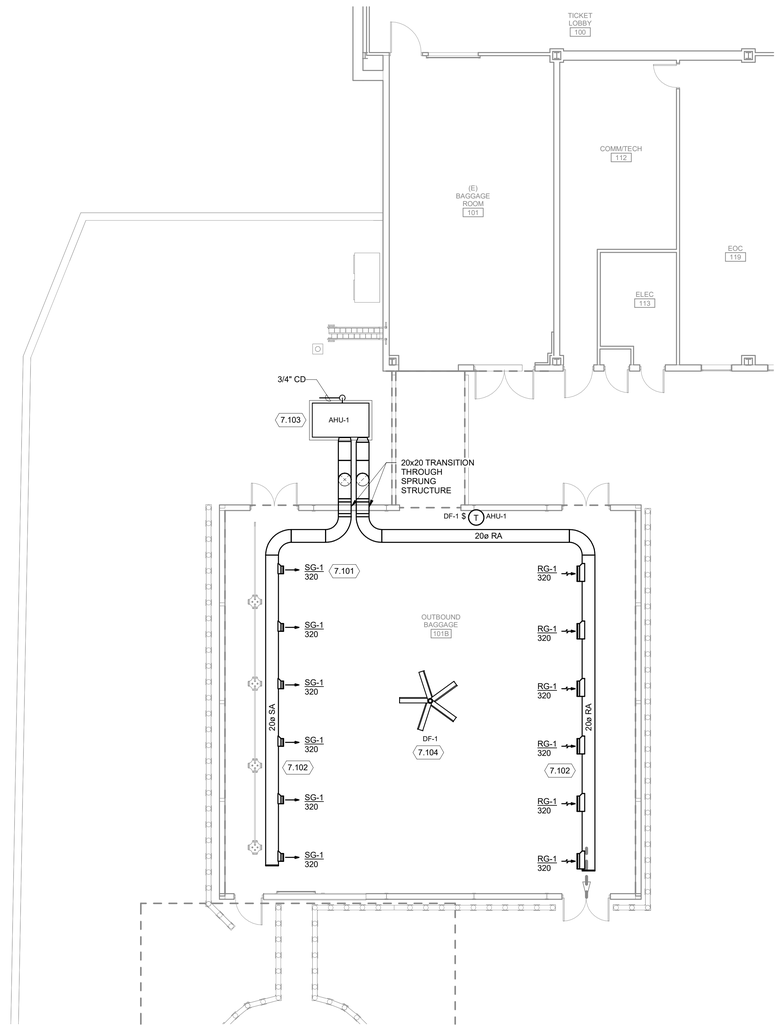
KEYED NOTES

7.101 ANGLE SG-1 (TYP). SEE DETAIL 3 ON M-501.

7.102 FOR DUCT SEISMIC SUPPORTS AND BRACING SEE DETAIL 1 ON M-502.

7.103 FOR EQUIPMENT SEISMIC SUPPORTS AND BRACING SEE DETAIL 2 ON M-502.

7.104 FOR DF SEISMIC SUPPORTS AND BRACING SEE DETAIL 3 ON M-502.



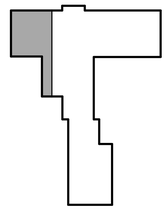
1 **FIRST FLOOR HVAC PLAN**
1/8" = 1'-0"

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KEY PLAN

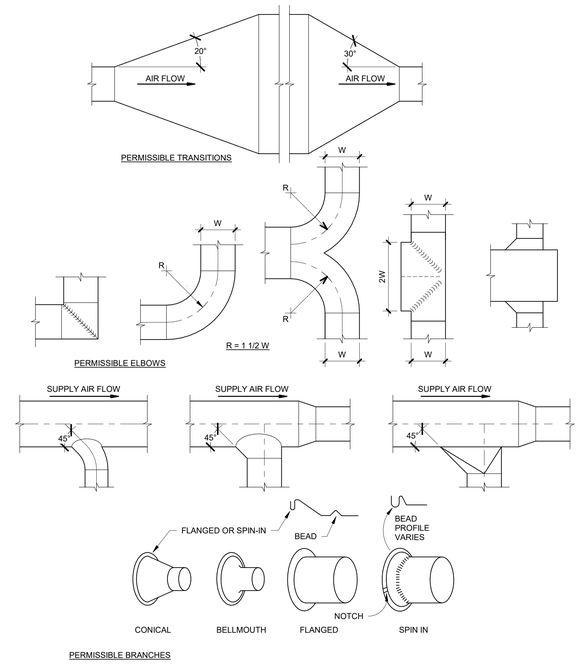
PROFESSIONAL ENGINEER
AARON D. KOCH
M 39091
MECHANICAL
STATE OF CALIFORNIA
1-27-2026

M&H NO.: 222814.02
DATE: September 30, 2025
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SHEET CONTENTS
FIRST FLOOR HVAC PLAN

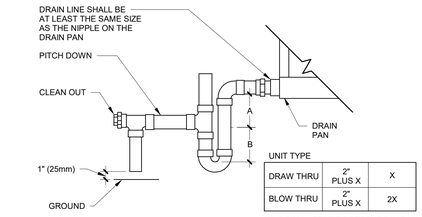
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M-101

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NOTE: FOR OTHER FITTINGS AND CONNECTIONS FOUND ON DRAWINGS, CONSTRUCT PER SMACNA.

1 TYPICAL DUCT TRANSITIONS AND FITTINGS
NO SCALE

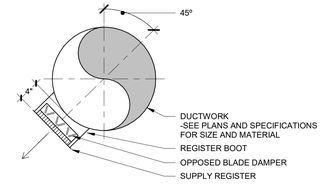


UNIT TYPE

DRAW THRU	2" PLUS X	X
BLOW THRU	2" PLUS X	2X

WHERE X = STATIC PRESSURE IN PAN

2 CONDENSATE DRAIN TRAP
NO SCALE



3 ANGLED SUPPLY REGISTER
NO SCALE

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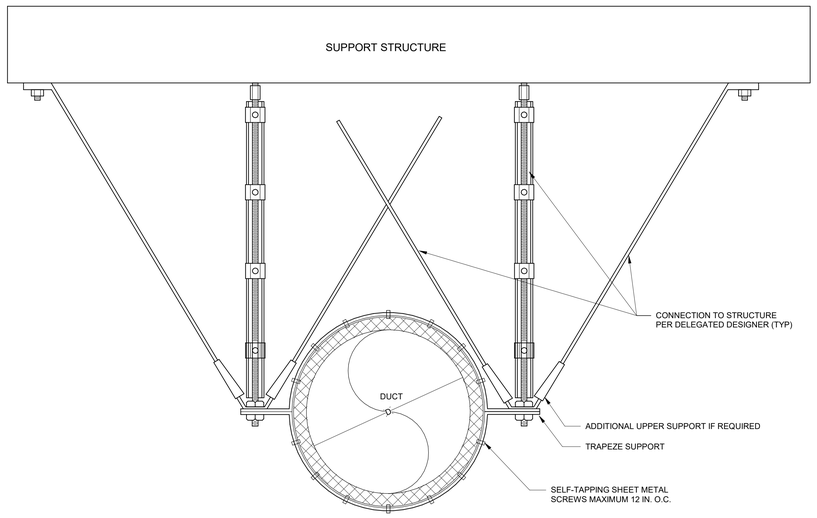
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SHEET CONTENTS
MECHANICAL DETAILS

SHEET NO.:
M-501

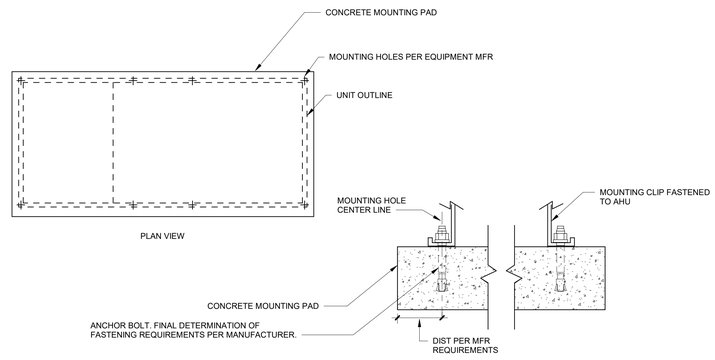
PROFESSIONAL ENGINEER
AARON D. KNUTH
M 39091
MECHANICAL
STATE OF CALIFORNIA
1-27-2026

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NOTE: A ROD STIFFENER ANGLE MAY BE REQUIRED AS SHOWN.
BRACE ANGLE RATIO MAY BE INCREASED TO 2 (VERT.) : 1 (HORIZ.)

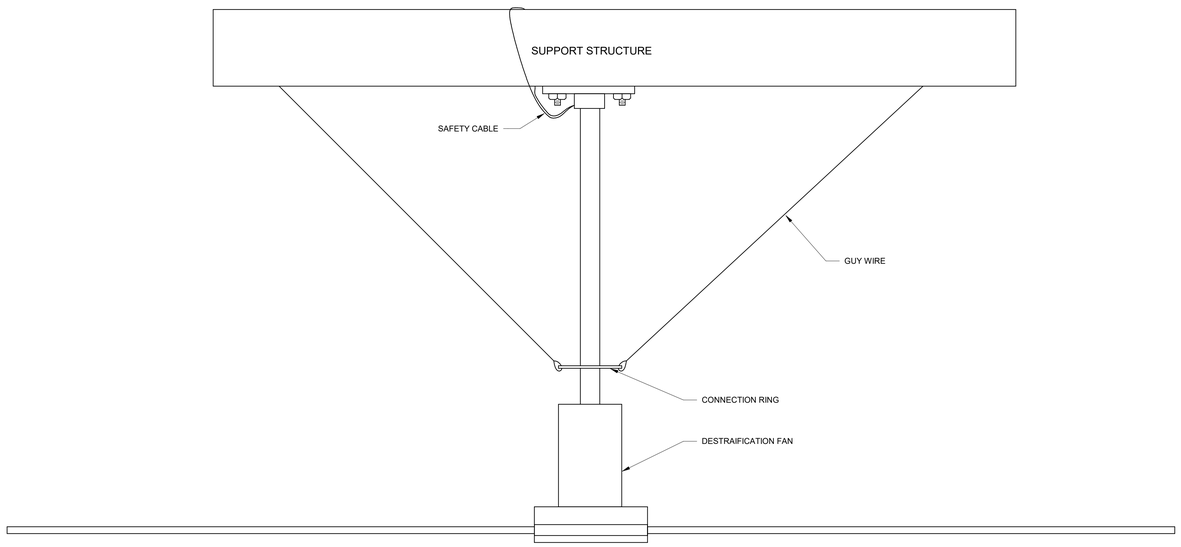
1 ALL-DIRECTIONAL SEISMIC CABLE BRACE FOR ROUND DUCT
NO SCALE



2 TYPICAL PAD SEISMIC MOUNTING DETAIL
NO SCALE

GENERAL SEISMIC NOTES

1. DETAILS SHOWN ON THIS SHEET ARE PRELIMINARY. ALL DETAILS SHALL BE VERIFIED OR REPLACED BY THE REGISTERED ENGINEER.
2. CONTRACTOR SHALL OBTAIN SERVICES OF AN ENGINEER REGISTERED AND LICENSED IN STATE OF CALIFORNIA TO DESIGN SEISMIC RESTRAINT SYSTEMS AND METHODS OF ANCHORAGE PER THE LOCATION AND CRITERIA OF THIS PROJECT.
3. SEISMIC-RESTRAINT LOADING PERFORMANCE REQUIREMENTS:
   A. SITE CLASS AS DEFINED IN THE IBC: SEE STRUCTURAL DRAWINGS
   B. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS
   C. COMPONENT IMPORTANCE FACTOR: SEE STRUCTURAL DRAWINGS
   D. COMPONENT RESPONSE MODIFICATION FACTOR: SEE STRUCTURAL DRAWINGS
   E. COMPONENT AMPLIFICATION FACTOR: SEE STRUCTURAL DRAWINGS
   F. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND): SEE STRUCTURAL DRAWINGS
   G. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIOD: SEE STRUCTURAL DRAWINGS
4. SEISMIC RESTRAINT LAYOUT(S) MUST BE REVIEWED AND APPROVED BY THE PIPING DESIGN ENGINEER
5. QUALITY ASSURANCE
   A. TESTING AGENCY QUALIFICATIONS: AN INDEPENDENT AGENCY, WITH THE EXPERIENCE AND CAPABILITY TO CONDUCT THE TESTING INDICATED, THAT IS A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) AS DEFINED BY OSHA IN 29 CFR 1910.7, AND THAT IS ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
   B. COMPLY WITH SEISMIC-RESTRAINT REQUIREMENTS IN THE IBC UNLESS REQUIREMENTS IN THIS SECTION ARE MORE STRINGENT.
   C. SEISMIC-RESTRAINT DEVICES SHALL HAVE HORIZONTAL AND VERTICAL LOAD TESTING AND ANALYSIS AND SHALL BEAR ANCHORAGE APPROVAL FROM AHJ, PREAPPROVAL BY ICC-ES, OR PREAPPROVAL BY ANOTHER AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, SHOWING MAXIMUM SEISMIC-RESTRAINT RATINGS. RATINGS BASED ON INDEPENDENT TESTING ARE PREFERRED TO RATINGS BASED ON CALCULATIONS. IF PREAPPROVED RATINGS ARE NOT AVAILABLE, SUBMITTALS BASED ON INDEPENDENT TESTING ARE PREFERRED. CALCULATIONS (INCLUDING COMBINING SHEAR AND TENSILE LOADS) TO SUPPORT SEISMIC-RESTRAINT DESIGNS MUST BE SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER.
6. SEISMIC-RESTRAINT DEVICES
   A. COORDINATE SPECIFICATIONS FOR SEISMIC-RESTRAINT COMPONENTS IN THIS ARTICLE WITH STRUCTURAL ENGINEER AND WITH DRAWINGS.
   B. INSTALL SYSTEM COMPONENTS PER MANUFACTURER RECOMMENDATIONS WHERE APPLICABLE.
   C. SUPPORT SYSTEM: SHOP- OR FIELD-FABRICATED SUPPORT ASSEMBLY MADE OF STEEL WITH ACCESSORIES FOR ATTACHMENT TO BRACED COMPONENT AT ONE END AND TO BUILDING STRUCTURE AT THE OTHER END AND OTHER MATCHING COMPONENTS AND WITH CORROSION-RESISTANT COATING; AND RATED IN TENSION, COMPRESSION, AND TORSION FORCES.
   D. BUSHINGS FOR FLOOR-MOUNTED EQUIPMENT ANCHOR BOLTS: NEOPRENE BUSHINGS DESIGNED FOR RIGID EQUIPMENT MOUNTINGS AND MATCHED TO TYPE AND SIZE OF ANCHOR BOLTS AND STUDS.
   E. RESILIENT ISOLATION WASHERS AND BUSHINGS: ONE-PIECE, MOLDED, OIL- AND WATER-RESISTANT NEOPRENE, WITH A FLAT WASHER FACE.
   F. MECHANICAL ANCHOR BOLTS: SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488.
   G. MINIMUM ROD DIAMETER FOR SINGLE RIGID ROD HANGERS SHALL FOLLOW MSS SP-58 REQUIREMENTS
7. SEISMIC-RESTRAINT DEVICE
   A. IF A DESIRED INSTALLATION METHOD VARIES FROM THE DETAILS PROVIDED BY THE DELEGATED DESIGNER, THE INSTALLER MUST OBTAIN DELEGATED DESIGNER APPROVAL PRIOR TO INSTALLATION.
   B. EQUIPMENT RESTRAINTS:
      a. SEISMIC ENGINEER AND INSTALLER SHALL COORDINATE WITH EQUIPMENT MANUFACTURER TO DETERMINE ANCHOR BOLT SIZES FOR HYDRONIC PUMPS, CHILLERS, BOILERS, AND FLUID COOLERS.
      b. INSTALL SEISMIC SNUBBERS ON HVAC EQUIPMENT MOUNTED ON VIBRATION ISOLATORS. LOCATE SNUBBERS AS CLOSE AS POSSIBLE TO VIBRATION ISOLATORS AND BOLT TO EQUIPMENT BASE AND SUPPORTING STRUCTURE.
      c. INSTALL RESILIENT BOLT ISOLATION WASHERS ON EQUIPMENT ANCHOR BOLTS WHERE CLEARANCE BETWEEN ANCHOR AND ADJACENT SURFACE EXCEEDS 0.125 INCH.
   C. IF CABLES ARE USED, INSTALL SO THEY DO NOT BEND ACROSS EDGES OF ADJACENT EQUIPMENT OR BUILDING STRUCTURE.
   D. INSTALL SEISMIC-RESTRAINT DEVICES USING METHODS APPROVED BY AN AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION PROVIDING REQUIRED SUBMITTALS FOR COMPONENT.
   E. INSTALL BUSHING ASSEMBLIES FOR ANCHOR BOLTS FOR FLOOR-MOUNTED EQUIPMENT, ARRANGED TO PROVIDE RESILIENT MEDIA BETWEEN ANCHOR BOLT AND MOUNTING HOLE IN CONCRETE BASE.
   F. ATTACHMENT TO STRUCTURE: IF SPECIFIC ATTACHMENT IS NOT INDICATED, ANCHOR BRACING TO STRUCTURE AT FLANGES OF BEAMS, AT UPPER TRUSS CHORDS OF BAR JOISTS, OR AT CONCRETE MEMBERS DO NOT ATTACH TO STEEL DECKING.
   G. DRILLED-IN ANCHORS:
      a. IDENTIFY POSITION OF REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO DRILLING HOLES FOR ANCHORS. DO NOT DAMAGE EXISTING REINFORCING OR EMBEDDED ITEMS DURING CORING OR DRILLING. NOTIFY THE STRUCTURAL ENGINEER IF REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED DURING DRILLING. LOCATE AND AVOID ELECTRICAL/TELECOMMUNICATIONS CONDUIT AND GAS LINES.
      b. DO NOT DRILL HOLES IN CONCRETE OR MASONRY UNTIL CONCRETE, MORTAR, OR GROUT HAS ACHIEVED FULL DESIGN STRENGTH.
      c. WEDGE ANCHORS: PROTECT THREADS FROM DAMAGE DURING ANCHOR INSTALLATION. HEAVY-DUTY SLEEVE ANCHORS SHALL BE INSTALLED WITH SLEEVE FULLY ENGAGED IN THE STRUCTURAL ELEMENT TO WHICH ANCHOR IS TO BE FASTENED.
      d. ADHESIVE ANCHORS: CLEAN HOLES TO REMOVE LOOSE MATERIAL AND DRILLING DUST PRIOR TO INSTALLATION OF ADHESIVE. PLACE ADHESIVE IN HOLES PROCEEDING FROM THE BOTTOM OF THE HOLE AND PROGRESSING TOWARD THE SURFACE IN SUCH A MANNER AS TO AVOID INTRODUCTION OF AIR POCKETS IN THE ADHESIVE.
      e. SET ANCHORS TO MANUFACTURER'S RECOMMENDED TORQUE, USING A TORQUE WRENCH.
      f. INSTALL ZINC-COATED STEEL ANCHORS FOR INTERIOR AND STAINLESS-STEEL ANCHORS FOR EXTERIOR APPLICATIONS.
8. THE NOTES AND DETAILS ON SEISMIC DRAWINGS ON THIS SHEET ARE INTENDED TO COMPLIMENT SPECIFICATION SECTION 23 05 48 - VIBRATION AND SEISMIC CONTROLS FOR HVAC. SHOULD THERE BE A CONFLICT BETWEEN THESE TWO SHEETS AND THE SPECIFICATION, THE SPECIFICATION SHALL GOVERN
9. OVERHEAD PIPING AND DUCTWORK TO BE SUPPORTED FROM STEEL BEAMS AND GIRDERS ONLY U.N.O.. CONNECTIONS TO METAL DECK ARE NOT ALLOWED. SUPPORT FROM FLOOR SLAB OR HOUSEKEEPING PADS ARE ONLY ALLOWED WHERE SHOWN



3 DESTRATIFICATION FAN SEISMIC DETAIL
NO SCALE

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.
975 Airport Dr, San Luis Obispo, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT
1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

M&H NO.: 222814.02
DATE: September 30, 2025
DESIGNED BY: KMK
DRAWN BY: KMK
CHECKED BY: ADK
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SHEET CONTENTS
SEISMIC DETAILS

PROFESSIONAL ENGINEER
AARON D. KOCH
M 39091
MECHANICAL
STATE OF CALIFORNIA
1-27-2026

SHEET NO.:
M-502

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AIR HANDLING UNIT (AHU) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	NOM. CAP. (TON)	SUPPLY FAN			MIN. OUTDOOR AIR FLOW (CFM)	COOLING COIL						HEAT PUMP HEATING				COMPRESSOR STAGES
			AIR FLOW (CFM)	ESP (IN WC)	TSP (IN WC)		EAT (°F)		LAT (°F)		TOTAL CAP. (MBH)	SENS. CAP. (MBH)	EAT (°F)	LAT (°F)	AMBIENT TEMP (°F)	CAPACITY (MBH)	
							DB	WB	DB	WB							
AHU-1	TRANE, WHC060H4R0A	5	1,920	1.0	1.2	200	75.0	62.0	52.5	51.5	59.3	49.9	63.0	84.9	34	45.3	2

MARK	ELECTRIC HEATER		FILTERS	REFRIG. TYPE	CONDENSER		ELECTRICAL				ACCESSORIES	WEIGHT WITH CURB (LB)	LOCATION	REMARKS
	CAP. (KW)	NO. OF STAGES			AMB. TEMP. (°F) MIN.	AMB. TEMP. (°F) MAX.	MIN. EER	VOLTS	PHASE	MCA	MOCP			
AHU-1	-	-	MERV 13	R-410A	0	115	12.9	460	3	12.0	15.0	1,3,4,5,6,11,12	1067	SEE PLANS	

ACCESSORIES

1	DRY BULB ECONOMIZER CONTROL	7	STANDARD ROOF CURB
2	ENTHALPY ECONOMIZER CONTROL	8	VIBRATION ISOLATION ROOF CURB
3	BAROMETRIC RELIEF	9	SEISMIC ROOF CURB
4	DISCONNECT SWITCH	10	SUPPLY AIR SMOKE DETECTOR
5	CONDENSER HAIL GUARDS	11	RETURN AIR SMOKE DETECTOR
6	15A GFI CONVENIENCE OUTLET	12	CONDENSATE OVERFLOW SWITCH

AIR OUTLET AND INLET SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	APPLICATION	(1) MAX AIRFLOW (CFM)	OUTLET / INLET	TYPE	MOUNTING SYSTEM	(2) DAMPER	(3) FACE SIZE (IN)	NECK SIZE (IN)	(4) MAX NOISE LEVEL (NC)	PATTERN	MAX SP (IN WG)	FINISH	MATERIAL	(5) MOUNTING HEIGHT (IN)	ACCESSORIES	LOCATION	REMARKS
SG-1	TITUS, 272RS	SUPPLY	410	2	2	4	OB	15x11	12x8	20	-	0.1	W	STEEL	130	-	101B	(6)
RG-1	TITUS, 272RS	RETURN/EXHAUST	410	2	3	4	OB	26x18	24x16	20	-	0.1	W	STEEL	130	-	101B	(7)

OUTLET/INLET		TYPE				MOUNTING SYSTEM		DAMPER		FINISH	
1	DIFFUSER	1	SINGLE DEFLECTION	9	LOUVERED	1	T-BAR CEILING	N	NONE	M	MILL
2	REGISTER	2	DOUBLE DEFLECTION	10	HOODED	2	PLASTER/CONCRETE CEILING	BF	BUTTERFLY	W	MFR. STANDARD WHITE
3	GRILLE	3	FIXED BLADE	11	DOOR TRANSFER	3	PLASTER/MASONRY WALL	G	GRAVITY	S	MFR. SPECIAL COLOR
4	LOUVER	4	PERFORATED	12	BRICK	4	EXPOSED DUCTWORK	MP	MOTORIZED PNEUMATIC	A	ANODIZED ALUMINUM
5	PENTHOUSE	5	LINEAR	13	PUNKAH	5	METAL PANEL WALL	ME	MOTORIZED ELECTRIC	P	PRIME COAT (FINAL COAT BY GC)
6	VENT	6	PLENUM SLOT	14	LAMINAR	6	FLOOR	OB	OPPOSED BLADE	O	OTHER (SEE SPECIFICATIONS)
		7	PLAQUE	15	DRUM	7	ROOF	PB	PARALLEL BLADE		
		8	EGGCRATE			8	EXTERIOR STUD WALL	LL	LOW LEAKAGE, INSUL.		

REMARKS:

(1) SEE PLANS FOR ACTUAL INDIVIDUAL AIR QUANTITIES OF EACH DEVICE.

(2) IF DAMPER IS SCHEDULED 'NONE', EACH SUPPLY, RETURN, AND EXHAUST DEVICE TO HAVE A BALANCE DAMPER IN THE DUCT BRANCH TAKE-OFF UNLESS AN ASSOCIATED VAV BOX SERVES A SINGLE DEVICE.

(3) BORDER TYPES SHALL BE COMPATIBLE WITH CEILING OR WALL TYPES WHERE AIR DEVICE IS LOCATED. REFER TO ARCHITECTURAL PLANS AND ALL OTHER TRADES.

(4) ALL GRILLES AND DIFFUSERS SHALL NOT EXCEED NOISE CRITERIA LISTED (BASED ON 10 DB ROOM ATTENUATION) AND AT THE SCHEDULED MAXIMUM STATIC PRESSURE DROP.

(5) MOUNTING HEIGHT SHALL BE FROM FINISHED FLOOR TO BOTTOM OF OPENING.

(6) INDIVIDUALLY ADJUSTABLE AIRFOIL BLADE WITH 3/4" SPACING. FRONT BLADES PARALLEL TO THE SHORT DIMENSION. INITIALLY SET BLADES FOR APPROXIMATELY 30 DEGREE THROW.

(7) BLADES PARALLEL TO THE LONG DIMENSION WITH FIXED 30 DEGREE DEFLECTION AND 3/4" SPACING.

DESTRATIFICATION FAN (DF) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	FAN TYPE	AIRFLOW RATE (CFM)	MOTOR		FAN SPEED (RPM)	DRIVE TYPE	ELECTRICAL (VOLTS/PH)	MOUNTING HEIGHT (FT)	MAX. SOUND (DB)	WEIGHT (LB)	LOCATION	REMARKS
				(HP)	TYPE								
DF-1	GREENHECK, DC-5-7	7' AIRFOIL	15,100	1/10	VFD	135	DIRECT	115/1	16	35	28	163	1,2,3,4,5

REMARKS:

(1) MOUNTING HEIGHT IS FROM FINISHED FLOOR TO BOTTOM OF FAN IN FEET.

(2) PROVIDE MOUNTING HARDWARE AND 6' DROP TUBE.

(3) PROVIDE WITH WALL MOUNTED REMOTE CONTROL FOR ON/OFF AND SPEED CONTROL.

(4) INTERLOCK THE DESTRAT FAN WITH THE FIRE ALARM SYSTEM TO SHUT OFF UPON ACTIVATION OF FIRE SUPPRESSION SYSTEM.

(5) PROVIDE ALL NECESSARY SUPPORT STEEL AS REQUIRED BY THE METAL BUILDING SUPPLIER.

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BAGGAGE SCREENING MODS.

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ISSUED

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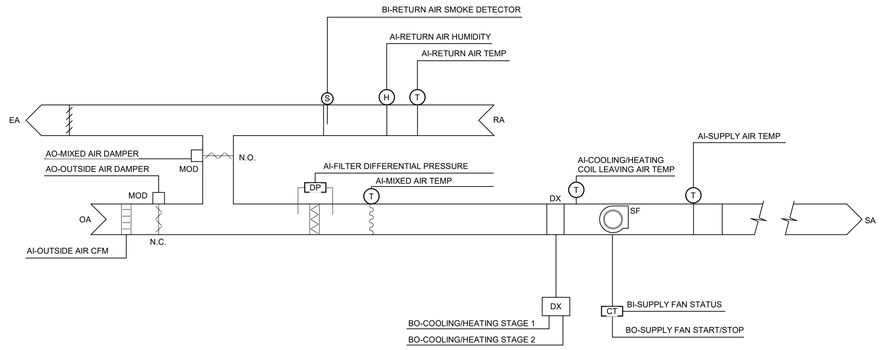
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DATE: September 30, 2025
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SHEET CONTENTS
HVAC SCHEDULES

PROFESSIONAL ENGINEER
AARON D. KOZEY
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1-27-2026

SHEET NO.:
M-601

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1 AIR HANDLING HEAT PUMP UNIT
NO SCALE

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BAGGAGE SCREENING MODS.

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SHEET CONTENTS:
CONTROL SCHEMATICS

SHEET NO.:
M-801

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MECHANICAL
STATE OF CALIFORNIA
1-27-2026

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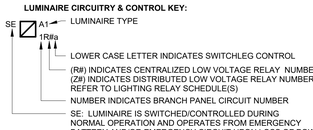
ONE-LINE SYMBOLS

- ATO — AUTOMATIC THROW OVER
- E / N / LS — AUTOMATIC TRANSFER SWITCH
- XXA 3P — CIRCUIT BREAKER
- XXAF / XXAT 3P — CIRCUIT BREAKER - DRAWOUT
- GF — XXAF / XXAT 3P — CIRCUIT BREAKER - GROUND FAULT
- CONTACT - NORMALLY CLOSED
- CONTACT - NORMALLY OPEN
- (#) — CURRENT TRANSFORMER (#) DENOTES QUANTITY
- DPM — DIGITAL POWER METER
- EARTH GROUND
- EPO — EMERGENCY POWER OFF
- XXA — FUSE
- XXA 3P / XXA — DISCONNECT SWITCH - FUSED
- XXA 3P — DISCONNECT SWITCH - NON-FUSED
- G / C / P — GENERATOR
- S2 / S1 / LS — GENERATOR TERMINATION CABINET
- K# — KEY INTERLOCK
- LA — LIGHTNING ARRESTOR
- LOAD BREAK ELBOW
- M — METER
- M — METER - DRAWOUT
- MPR — MULTI-FUNCTION PROTECTIVE RELAY
- XX / RM ## — PANEL
- SPD — SURGE PROTECTIVE DEVICE
- T-XX / RM ## — TRANSFORMER
- UNINTERRUPTIBLE POWER SUPPLY (UPS)
- UTILITY CONNECTION

LUMINAIRE SYMBOLS

- RECESSED LUMINAIRE
- RECESSED TROFFER
- RECESSED LINEAR
- SURFACE ROUND LUMINAIRE
- SURFACE SQUARE LUMINAIRE
- SURFACE LINEAR/INDUSTRIAL LUMINAIRE
- SURFACE COVE STRIP
- PENDANT ROUND LUMINAIRE
- PENDANT SQUARE LUMINAIRE
- PENDANT LINEAR/INDUSTRIAL LUMINAIRE
- (#) — TRACK (#) INDICATES NUMBER TRACK HEADS
- WALL SURFACE LUMINAIRE
- WALL RECESSED LUMINAIRE
- WALL SURFACE LINEAR
- WALL RECESSED LINEAR
- CEILING MOUNTED EXIT SIGN
- WALL MOUNTED EXIT SIGN
- WALL MOUNTED COMBINATION EXIT SIGN/EBU
- ARROW EXIT SIGN CHEVRON
- EMERGENCY BATTERY UNIT
- RECESSED EMERGENCY BATTERY UNIT
- WALL WASH MODIFIER
- EMERGENCY (NEC 700) SHADING MODIFIER
- LEGALLY REQUIRED STANDBY (NEC 701) AND OPTIONAL STANDBY (NEC 702) SHADING MODIFIER

LUMINAIRE CIRCUITRY & CONTROL KEY:



LUMINAIRE CONTROL SYMBOLS

- OS — OCCUPANCY SENSOR CEILING MOUNT
- OSW — OCCUPANCY SENSOR CORNER (WALL/CEILING) MOUNT
- DS — DAYLIGHT SENSOR
- VS — VACANCY SENSOR CEILING MOUNT
- TC — ELECTRONIC TIME CLOCK
- PC — PHOTOCELL
- LC — LIGHTING CONTACTOR
- LCP-X — LIGHTING CONTROL PANEL (x REPRESENTS PANEL DESIGNATION)
- DR — DIMMER CABINET
- PT — UL 924 LISTED EMERGENCY LIGHTING CONTROL UNIT. REFER TO SPECIFICATIONS 260923.
- PS — REMOTE POWER SUPPLY OR DRIVER
- D — DIMMER CONTROL STATION; MODULAR DIMMING CONTROL
- L — DIGITAL CONTROL STATION
- S — LINE VOLTAGE SWITCH (NO NOTATION INDICATES SINGLE POLE)

LUMINAIRE CONTROL NOTATIONS:

a,b	LOWER CASE LETTERS DENOTE SWITCHLEG
3	3-WAY CONTROL
4	4-WAY CONTROL
C	MAINTAINED CONTACT, THREE POSITION, CENTER OFF CONTROL
D	DIMMING CONTROL
DMX	DMX CONTROL
E	EMERGENCY
ES	ENTRY STATION
F	FAN SPEED CONTROL
K	KEY SWITCH CONTROL
M	MOMENTARY CONTACT CONTROL
MCS	MASTER CONTROL STATION
OS	OCCUPANCY SENSOR
OSD	DIMMING OCCUPANCY SENSOR
P	PILOT LIGHT CONTROL
PB	PUSH BUTTON CONTROL
PS	PARTITION SPACE CONTROL
SC	SCENE CONTROL
T	TIMER CONTROL
VS	VACANCY SENSOR
VSD	DIMMING VACANCY SENSOR
WL	WET LOCATION CONTROL
X1	EXPLOSION PROOF CLASS 1 DIVISION 1 CONTROL
X2	EXPLOSION PROOF CLASS 1 DIVISION 2 CONTROL

SERVICE & DISTRIBUTION SYMBOLS

- GAP — GENERATOR ANNUNICATOR PANEL
- EPO / X — EMERGENCY POWER OFF SWITCH, MUSHROOM HEAD PUSH BUTTON AT 48" AFF. B: BOILER SHUT-OFF NAMEPLATE G: GENERATOR SHUT-OFF NAMEPLATE
- PFC — POWER FACTOR CORRECTION CAPACITOR
- AHF — ACTIVE HARMONIC FILTER
- FEEDER BUS DUCT
- PANELBOARD
- ATS — AUTOMATIC TRANSFER SWITCH
- MTS — MANUAL TRANSFER SWITCH
- EMERGENCY SHADING MODIFIER

GROUNDING & LIGHTNING PROTECTION SYMBOLS

- GROUND ACCESS WELL
- GROUND ROD
- GR — STATIC GROUND RECEPTACLE
- LIGHTNING PROTECTION SYSTEM AIR TERMINAL
- GROUNDING CONDUCTOR
- EGB — EQUIPMENT GROUND BUS

WIRING DEVICE SYMBOLS

- DUPLEX RECEPTACLE
- DOUBLE DUPLEX RECEPTACLE
- ABOVE COUNTER DUPLEX RECEPTACLE
- SIMPLEX RECEPTACLE
- SPLIT WIRED DUPLEX RECEPTACLE
- SPECIFIC USE RECEPTACLE. NEMA CONFIGURATIONS NOTED ON DRAWINGS AND/OR SCHEDULE.
- F — FLOOR BOX
- P — POKE THRU
- C — CEILING MOUNTED DUPLEX RECEPTACLE
- C — CEILING MOUNTED DOUBLE DUPLEX RECEPTACLE
- C — CEILING MOUNTED SPECIFIC USE RECEPTACLE. NEMA CONFIGURATIONS NOTED ON DRAWINGS AND/OR SCHEDULE.
- E — CORD REEL
- C — CONTACTOR
- PUSH BUTTON
- SURFACE METAL RACEWAY - REFER TO DRAWINGS AND/OR SPECIFICATIONS, MOUNTED 6" ABOVE COUNTER OR AT HEIGHT AS INDICATED.
- A — MULTI-OUTLET RACEWAY - OUTLETS ON CENTER AS INDICATED ON DRAWINGS AND IN THE SPECIFICATIONS, MOUNTED 6" ABOVE COUNTER OR AT HEIGHT AS INDICATED.

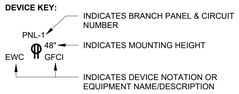
MULTI-OUTLET RACEWAY NOTATIONS:

A	2'-0" LENGTH, RECEPTACLES 6" O.C.
B	3'-0" LENGTH, RECEPTACLES 6" O.C.
C	5'-0" LENGTH, RECEPTACLES 6" OR 12" O.C.
D	6'-0" LENGTH, RECEPTACLES 6", 12", 18" OR 24" O.C.
F	X'-X" LENGTH, RECEPTACLES X" O.C.
P	DATA/POWER POLE
	OPTIONAL STANDBY (NEC 702) SHADING MODIFIER

RECEPTACLE NOTATIONS:

a	SWITCH LEG FOR SWITCHED OUTLETS
D	DEDICATED OUTLETS
EWC	ELECTRIC WATER COOLER OUTLETS
GFCI	GROUND FAULT INTERRUPTER OUTLETS
IG	ISOLATED GROUND OUTLETS
H	HORIZONTALLY MOUNTED OUTLETS
L	CASEWORK MOUNTED OUTLETS
M	MODULAR FURNITURE MOUNTED OUTLETS
PL	PLUG LOAD CONTROLLED OUTLETS
TR	TAMPER RESISTANT SAFETY OUTLETS
USB	COMBINATION DUPLEX/USB OUTLETS
WP	WEATHER PROOF OUTLETS
X1	EXPLOSION PROOF CLASS 1 DIVISION 1 OUTLETS
X2	EXPLOSION PROOF CLASS 1 DIVISION 2 OUTLETS

DEVICE KEY:



SLASH MAY BE USED TO SEPARATE INFORMATION . EX: 48"/GFCI

RACEWAY SYMBOLS

- SURFACE MOUNTED CONDUIT
- CONCEALED CONDUIT IN CEILING OR WALL
- WIREWAY, SIZE AND TYPE AS INDICATED ON DRAWINGS
- CABLE TRAY, SIZE AND TYPE AS INDICATED ON DRAWINGS
- UNDERFLOOR DUCT
- J — JUNCTION BOX - CEILING MOUNTED
- J — JUNCTION BOX - WALL MOUNTED

MOTOR CONTROL & PROTECTIVE DEVICE SYMBOLS

- ELECTRICAL CONNECTION TO EQUIPMENT AND MOTORS, SIZED PER NEC. COORDINATE REQUIREMENTS WITH CONTRACTOR FURNISHING MOTOR OR EQUIPMENT. REFER TO SPECIFICATIONS AND EQUIPMENT WIRING SCHEDULE FOR ADDITIONAL WORK ASSOCIATED WITH MOTOR OR EQUIPMENT.
- COMBINATION FULL VOLTAGE MAGNETIC CONTROLLER
- M — INTEGRAL HORSEPOWER MANUAL CONTROLLER
- SS — COMBINATION REDUCED VOLTAGE SOLID STATE CONTROLLER
- SS — REDUCED VOLTAGE SOLID STATE CONTROLLER
- VFD — VARIABLE FREQUENCY MOTOR CONTROLLER
- ENCLOSED FULL VOLTAGE MAGNETIC CONTROLLER
- NON-FUSIBLE DISCONNECT SWITCH
- FUSIBLE DISCONNECT SWITCH
- DOUBLE THROW SWITCH
- S_{FS} — BUSS FUSESTAT TYPE SSY
- S_{MS} — MANUAL MOTOR STARTER (W/OVERLOAD RELAYS)
- S_{MX} — MANUAL MOTOR SWITCH
- RVS — ENCLOSED REDUCED VOLTAGE CONTROLLER
- RVS — COMBINATION REDUCED VOLTAGE CONTROLLER
- MS — MULTI SPEED MAGNETIC CONTROLLER
- MS — COMBINATION MULTI SPEED MAGNETIC CONTROLLER
- ENCLOSED CIRCUIT BREAKER
- LEGALLY REQUIRED STANDBY (NEC 701) AND OPTIONAL STANDBY (NEC 702) SHADING MODIFIER

SITE SYMBOLS

- GROUND MOUNTED LIGHT (ABOVE & BELOW GRADE MOUNTING)
- E — ELECTRIC HANDHOLE
- HH — HANDHOLE, GENERIC
- E — ELECTRIC MANHOLE
- ELECTRIC PEDESTAL BOX
- BOLLARD LIGHT
- DOUBLE LIGHT POLE
- LIGHT POLE
- POST TOP LIGHT POLE
- POWER POLE
- DOUBLE POWER POLE
- POWER POLE WITH LIGHT

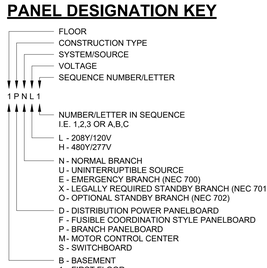
GENERAL SYMBOLS

- #/E-### — DETAIL NUMBER / SHEET NUMBER
- 9.### — KEYED NOTE: USED TO DESCRIBE ADDITIONAL INFORMATION OF WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL IT IS SHOWN WITH
- # — KITCHEN EQUIPMENT TAG: # REFERS TO CORRESPONDING NUMBER IN KITCHEN EQUIPMENT SCHEDULE
- XXX — LIGHTING CONTROL SEQUENCE OF OPERATIONS TAG: XXX REFERS TO CORRESPONDING TYPE IN THE LIGHTING CONTROL SEQUENCE OF OPERATIONS SCHEDULE.

LINE TYPE KEY

- NEW WORK BY THIS CONTRACTOR (DARK SOLID LINE)
- EXISTING TO BE REMOVED BY THIS CONTRACTOR (DARK DASHED LINE)
- EXISTING TO REMAIN WORK (THIN SOLID LINE)
- NEW WORK UNDER FLOOR BY THIS CONTRACTOR
- ONE-LINE EQUIPMENT ENCLOSURE
- PANEL DIVISION LINES
- —CON— SITE UNDERGROUND CONDUIT
- —//CON//— SITE UNDERGROUND CONDUIT TO BE REMOVED
- —E— SITE UNDERGROUND ELECTRIC
- —//E//— SITE UNDERGROUND ELECTRIC TO BE REMOVED
- —OHE— SITE OVERHEAD ELECTRIC
- —//OHE//— SITE OVERHEAD ELECTRIC TO BE REMOVED

PANEL DESIGNATION KEY



ELECTRICAL ABBREVIATIONS

3R	NEMA 3R RATING
4X	NEMA 4X RATING
A	AMPERES
A/E	ARCHITECT / ENGINEER
AAC	ABOVE ACCESSIBLE CEILING
ACCU	AIR COOLED CONDENSING UNIT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
APE	AIRCRAFT PROCESS EQUIPMENT
ATS	AUTOMATIC TRANSFER SWITCH
BLDG	BUILDING
BRKR	BREAKER
C	CONDUIT
CB	CIRCUIT BREAKER
CEB	CONCRETE EQUIPMENT BASE
CF	CIRCULATION FAN
CH	CHILLER
CHWP	CHILLED WATER PUMP
CKT	CIRCUIT
CP	CIRCULATION PUMP
CRAC	COMPUTER ROOM AIR CONDITIONER
CRP	CONDENSATION RETURN
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
DC	DROP CORD
DDC	DIGITAL CONTROL PANEL
DH	DUCT HEATER
DISC	DISCONNECT
DO	DOOR OPERATOR
DWG	DRAWING
E/O	ELECTRICAL-TO-OPTICAL CONVERTER
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ERL	EXISTING TO BE RELOCATED
ERLD	EXISTING - RELOCATED LOCATION
ES	EQUIPMENT SUPPLIER
ETR	EXISTING TO REMAIN
EWC	ELECTRICAL WATER COOLER
EWH	ELECTRICAL WATER HEATER
F	FUSED
FA	FIRE ALARM
FAF	FORCED AIR FURNACE
FCU	FAN COIL UNIT
GD	GARBAGE DISPOSAL
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
GWH	GAS WATER HEATER
HD	HAND DRYER
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWB	HOT WATER BOILER
HWP	HOT WATER PUMP
IEWH	INSTANTANEOUS ELECTRIC WATER HEATER
IH	INFRARED HEATER
IMC	INTERMEDIATE METALLIC CONDUIT
IWH	INSTANTANEOUS WATER HEATER
J-BOX	JUNCTION BOX
LBS	POUNDS
LFS	LIGHTING FIXTURE SCHEDULE
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MDF	MAIN DISTRIBUTION FRAME
MDP	MAIN DISTRIBUTION PANEL
MIN.	MINIMUM
MNS	MASS NOTIFICATION SYSTEM
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NL/EL	NIGHT LIGHT AND EMERGENCY LIGHT
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
PH	PHASE
PNL	PANEL
PVC	POLYVINYL CHLORIDE
RCP	RADIANT CEILING PANEL
RECPT	RECEPTACLE
REF	REFRIGERATOR
REQ'D	REQUIRED
RF	RETURN FAN
RGS	RIGID GALVANIZED STEEL CONDUIT MAY ALSO BE REFERENCED AS RMC OR GRC
RMC	RIGID METAL CONDUIT
RTU	ROOF TOP UNIT
S/N	SOLID NEUTRAL
SE	SERVICE ENTRANCE
SEC-P	SECURITY PANEL
SF	SUPPLY FAN
SP	SUMP PUMP
SS	STAINLESS STEEL
SW	SWITCH
SWBK	SWITCH BANK
TBR	TO BE REMOVED
TCP	TEMPERATURE CONTROL PANEL
TFA	TO FLOOR ABOVE
TFB	TO FLOOR BELOW
TYP	TYPICAL
UC	UNIT COOLER
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATER
V	VOLTS
VER	VEHICLE EXHAUST REEL
VFD	VARIABLE FREQUENCY DRIVE
VS	VERSUS
W	WATTS
WCC	WATER COOLED CONDENSER
WFE	WELDING FUME EXTRACTOR
WH	WATER HEATER
WL	WET LOCATION LISTED
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

CONTRACTOR ABBREVIATIONS

AVC	AUDIO/VISUAL CONTRACTOR
CC	CIVIL CONTRACTOR
EC	ELECTRICAL CONTRACTOR
FPC	FIRE PROTECTION CONTRACTOR
GC	GENERAL CONTRACTOR
HC	HEATING CONTRACTOR
MC	MECHANICAL CONTRACTOR
PC	PLUMBING CONTRACTOR
TC	TECHNOLOGY CONTRACTOR
TCC	TEMPERATURE CONTROLS CONTRACTOR
VC	VENTILATION CONTRACTOR

GENERAL NOTES:

1. REFER TO THE G SERIES DRAWINGS FOR CODE ANALYSIS PLANS, INFORMATION AND NOTES.
2. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE DETAILS OF WORK, VERIFY DIMENSIONS IN THE FIELD, AND ADVISE THE **[ARCHITECT/ENGINEER] [CONTRACTING OFFICER]** OF ANY DISCREPANCY BEFORE PERFORMING ANY WORK.
3. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES) AND ABA (ARCHITECTURAL BARRIERS ACT).
4. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATED WALLS AND FLOORS. MAKE RATED PENETRATIONS AS REQUIRED. SEAL ALL RATED PENETRATIONS. REFER TO DIV. 07 FOR ADDITIONAL INFORMATION AND REQUIREMENTS SPECIFIC TO FIRESTOPPING.
5. FLUSH-MOUNT ALL LIGHTING CONTROL DEVICES AT 42" FROM FINISHED FLOOR TO CENTERLINE OF DEVICE, EXCEPT WHERE OTHERWISE NOTED.
6. FLUSH-MOUNT ALL RECEPTACLES AT 18" FROM FINISHED FLOOR TO CENTERLINE OF DEVICE, EXCEPT WHERE OTHERWISE NOTED.
7. MOUNT ALL FIRE ALARM PULL STATIONS AT 42" FROM FINISHED FLOOR TO CENTERLINE OF DEVICE, EXCEPT WHERE OTHERWISE NOTED. **[REMOVE NOTE IF FIRE ALARM IS NOT IN E-SET]**
8. MOUNT ALL WALL-MOUNTED FIRE ALARM NOTIFICATION DEVICES AT 90" ABOVE FINISHED FLOOR OR 6" BELOW CEILING, WHICHEVER IS LOWER, EXCEPT WHERE OTHERWISE NOTED. HEIGHT IS MEASURED TO TOP OF DEVICE. **[REMOVE NOTE IF FIRE ALARM IS NOT IN E-SET]**
9. CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL SCHEDULES PROVIDED. BALANCE THE LOAD ON PANELS AS EVENLY AS POSSIBLE BETWEEN EACH PHASE. COMMON NEUTRALS MAY **[NOT]** BE USED FOR BRANCH CIRCUITS.
10. CIRCUITS SERVING EMERGENCY AND EXIT LUMINAIRES SHALL BE RUN IN SEPARATE RACEWAY FROM ALL OTHER CIRCUITS.
11. A #12 GREEN INSULATED GROUND CONDUCTOR SHALL BE INSTALLED WITH CIRCUIT CONDUCTORS TO ALL RECEPTACLES.
12. CONCEAL ALL CONDUIT IN WALLS, PARTITIONS, ABOVE CEILING, ETC. UNLESS OTHERWISE INDICATED ON THE PLANS OR IN THE SPECIFICATIONS. CONDUIT IN MECHANICAL ROOMS, AND STORAGE ROOMS WITHOUT CEILINGS MAY BE EXPOSED ON BUILDING STRUCTURE. WHERE RACEWAY IS REQUIRED ON EXISTING CONCRETE AND MASONRY WALLS, SURFACE RACEWAY MAY BE USED IN LIEU OF CHANNELING WALLS TO ALLOW CONCEALED ROUTING. THE RACEWAY SHALL BE SINGLE CHANNEL STYLE TYPE WITH IVORY FINISH. THIS APPLIES FOR BRANCH CIRCUIT CONDUITS UP TO 3/4" SIZE. CONDUITS LARGER THAN 3/4" MAY BE ROUTED EXPOSED, BUT INSTALLED PARALLEL AND/OR PERPENDICULAR TO BUILDING LINES AND RUN AS UNOBTRUSIVELY AS POSSIBLE.
13. BOXES LOCATED ON OPPOSITE SIDES OF NON-RATED WALLS SHALL BE OFFSET A MINIMUM OF 6" HORIZONTALLY. "THRU-THE-WALL" BOXES SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
14. COORDINATE AND CO-LOCATE WALL MOUNTED RECEPTACLE LOCATIONS WITH TECHNOLOGY (VOICE/DATA, CATV, FIDS, ETC.) OUTLETS SHOWN ON THE T-SERIES DRAWINGS UNLESS OTHERWISE NOTED, EACH TECHNOLOGY OUTLET SHALL BE LOCATED WITHIN 24" OF ITS ASSOCIATED RECEPTACLE. ASSOCIATED RECEPTACLE SHALL BE DEFINED AS THE RECEPTACLE NEAREST THE LOCATION OF, AND AT THE SAME HEIGHT AS, THE TECHNOLOGY OUTLET WHEN MULTIPLE RECEPTACLES ARE SHOWN ON A WALL.
15. DUPLEX RECEPTACLES FOR ELECTRIC WATER COOLERS (EWC) SHALL BE CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE DIRECTLY BELOW AND CENTERED ON EWC. VERIFY TYPE OF EWC TO BE INSTALLED.
16. COORDINATE THE LOCATION OF ALL DETECTORS WITH LUMINAIRES, SPRINKLERS, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE.
17. VERIFY ALL FURNITURE, MODULAR FURNITURE AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS AND REVIEWED SHOP DRAWINGS. PRIOR TO ELECTRICAL INSTALLATION ADJUST RECEPTACLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
18. ELECTRICAL AND TECHNOLOGY EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF, OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL AND TECHNOLOGY EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.
19. PROVIDE SUITABLE MECHANICAL PROTECTION AROUND ALL CONDUITS STUBBED OUT FROM FLOORS, WALLS, OR CEILINGS DURING CONSTRUCTION TO PREVENT BENDING OR DAMAGING OF STUB OUTS DUE TO CARELESSNESS WITH CONSTRUCTION EQUIPMENT.
20. ALL OPENINGS IN WALLS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
21. DRAWINGS INDICATE THE EXTENT OF HAZARDOUS OR WET LOCATIONS. INSTALLATION MEANS AND METHODS SHALL BE SUITABLY RATED FOR THE ENVIRONMENT INDICATED ON THE DRAWINGS.
22. REMOVE AND REINSTALL ALL CEILING TILES AS REQUIRED FOR THE EXECUTION OF ELECTRICAL WORK THAT IS OUTSIDE THE CONTRACT LIMITS OF CONSTRUCTION. REPLACE CEILING TILES WITH IDENTICAL MATERIAL WHERE DAMAGED BY THIS CONTRACTOR.
23. ALL INTERLOCKING REQUIRED BY THE DRIVE MANUFACTURER BETWEEN THE VARIABLE FREQUENCY DRIVE AND THE DISCONNECT SWITCHES SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
24. SCCR RATINGS LISTED FOR EQUIPMENT ARE MINIMUM REQUIREMENTS FOR BUS BRACING AND DEVICE RATING. ALL EQUIPMENT SHALL BE FULLY RATED UNLESS SPECIFICALLY NOTED AS SERIES RATED.

DEMOLITION GENERAL NOTES:

1. THE INFORMATION SHOWN IS BASED ON EXISTING DRAWINGS AND SITE OBSERVATIONS TO ASSIST CONTRACTOR IN BIDDING. THE ELECTRICAL DRAWINGS INDICATE EXISTING ELECTRICAL ITEMS TO BE REMOVED. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS. REFER TO SPECIFICATION SECTION 26 05 02 FOR ADDITIONAL REQUIREMENTS.
2. DASHED WALLS ON THE FLOOR PLANS INDICATE EXISTING WALLS BEING DEMOLISHED. REFER TO THE ARCHITECTURAL DEMOLITION PLANS FOR THE EXACT EXTENT OF WORK REQUIRED BY THIS PROJECT. REMOVE ALL DEVICES ON DASHED WALLS NOT SHOWN ON THE CONTRACT DRAWINGS. REFER TO DEMOLITION DRAWINGS OF OTHER TRADES, WHERE MOTORS, CONTROL PANELS, AND OTHER LOADS OR APPARATUS THAT HAVE ELECTRICAL CONNECTIONS ARE BEING REMOVED, INCLUDE DISCONNECTION AND REMOVAL OF ALL ASSOCIATED CONDUIT, WIRING, ETC.
3. ELECTRICAL ITEMS (i.e., LIGHTING FIXTURES, PANELBOARDS, DISCONNECTS, MOTOR CONTROLLERS, ETC.) REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER IN A STORAGE AREA TO BE DESIGNATED BY THE OWNER. EQUIPMENT BEING REMOVED SHALL BE HANDLED SO AS NOT TO FURTHER REDUCE ITS VALUE TO THE OWNER. DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.
4. WHERE LIGHTS, SWITCHES, RECEPTACLES, ETC., ARE BEING REMOVED, ALL ASSOCIATED CONDUIT AND WIRE BACK TO THE PANELBOARD OR FEEDER JUNCTION BOX SERVING THE DEVICE SHALL ALSO BE REMOVED, UNLESS THE CONDUIT CAN BE REUSED FOR NEW CONDUCTORS. DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.
5. ALL BOXES THAT ARE TO REMAIN IN PLACE IN EXISTING MASONRY WALLS SHALL BE PROVIDED WITH A BLANK COVERPLATE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH TYPE AND ATTACHMENT.
6. REMOVE ALL CONDUIT WHERE WALLS ARE BEING REMOVED. WHERE CONDUIT IS IN THE CONCRETE SLAB, CUT OFF FLUSH, PULL OUT WIRE, AND PLUG. WHERE CONDUIT IS RUN EXPOSED, ALL ASSOCIATED CLAMPS, SUPPORTS, HANGERS, ETC., SHALL ALSO BE REMOVED. CONDUIT CONCEALED IN WALL CONSTRUCTION MAY BE ABANDONED IN PLACE IF NOT AFFECTED BY OTHER CONSTRUCTION.
7. COORDINATE ALL WORK, INCLUDING PHASING WITH OTHER CONTRACTORS AT THE JOB SITE BEFORE REMOVING EXISTING ELECTRICAL AND INSTALLING NEW ITEMS.
8. EXISTING CONDUIT IN GOOD CONDITION MAY BE REUSED IN PLACE. RELOCATED EXISTING CONDUIT SHALL NOT BE ALLOWED. BONDING CONDUCTORS SHALL BE INSTALLED IN ALL REUSED CONDUIT TO ASSURE PROPER GROUND PATH.
9. MAINTAIN CIRCUIT CONTINUITY OF DEVICES LOCATED OUTSIDE OF CONSTRUCTION AREA. DEVICE AND EQUIPMENT REMOVAL IN CERTAIN LOCATIONS MAY REQUIRE THE INSTALLATION OF A JUNCTION BOX TO RECONNECT CIRCUITS THAT REMAIN IN OPERATION. EXTEND CONDUIT AND WIRING AS REQUIRED TO MAINTAIN POWER TO REMAINING EQUIPMENT.
10. BALLASTS MANUFACTURED PRIOR TO 1980 CONTAIN PCBs AND SHALL BE DISPOSED OF IN ACCORDANCE WITH SPECIFICATIONS.
11. HID AND FLUORESCENT LAMPS CONTAIN MERCURY AND SHALL BE DISPOSED OF IN ACCORDANCE WITH SPECIFICATIONS.
12. REMOVE AND REINSTALL ALL CEILING TILES AS REQUIRED FOR THE EXECUTION OF ELECTRICAL WORK THAT IS OUTSIDE THE CONTRACT LIMITS OF CONSTRUCTION. REPLACE CEILING TILES WITH IDENTICAL MATERIAL WHERE DAMAGED BY THIS CONTRACTOR.
13. PROVIDE REVISED, TYPED CIRCUIT DIRECTORY IN PANELBOARDS THAT HAVE CIRCUITS REMOVED OR ADDED CIRCUITS.
14. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CUT RACEWAY FLUSH WITH WALLS AND FLOORS AND PATCH SURFACES TO MATCH EXISTING. REMOVE ALL ASSOCIATED CLAMPS, HANGERS, SUPPORTS, ETC. ASSOCIATED WITH RACEWAY REMOVAL.
15. DISCONNECT AND REMOVE ELECTRICAL DEVICES AND EQUIPMENT SERVING UTILIZATION EQUIPMENT THAT HAS BEEN REMOVED.

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT

M&H NO.: 1943000-222814.02
DATE: September 30, 2025
DESIGNED BY: RJV
DRAWN BY: RJV
CHECKED BY: JRH
DO NOT SCALE DRAWINGS

SHEET CONTENTS
NOTES, SYMBOLS & ABBREVIATIONS

SHEET NO.:
E-001

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ELECTRICAL KEYED NOTES

9.001 EQUIPMENT TO BE RE-LOCATED BY BHS CONTRACTOR. FIELD WIRING SHALL BE REMOVED BY DIV 26. REMOVE ALL POWER WIRING FROM EDS MACHINE FROM EQUIPMENT BACK TO SOURCE. WHERE EQUIPMENT IS PLUG AND RECEPTACLE STYLE, WIRING FROM FLOOR BOX TO PANEL MAY REMAIN IN PLACE. FLOOR BOX SHALL BE PROVIDED WITH PERMANENT, BUT REMOVABLE BLANK, FLUSH COVER.

9.002 (TYP) BAGGAGE HANDLING EQUIPMENT WIRED BACK TO MCP SHALL BE REMOVED ENTIRELY BY BHS CONTRACTOR, INCLUDING WIRING. ALL TSA EQUIPMENT WIRING AND RACEWAYS SHALL BE REMOVED BACK TO SOURCE, INCLUDING BUT NOT LIMITED TO WORKSTATIONS, ETD UNITS, AND OTHER EQUIPMENT NOT WIRED TO MCP BY DIV 26. WIRING FOR HARD WIRED EQUIPMENT SHALL BE REMOVED FROM EQUIPMENT, BACK TO ITS SOURCE INCLUDING ALL RACEWAYS, SUPPORTS, ETC. FLUSH WALL OR FLOOR DEVICES SERVING PLUG CONNECTED EQUIPMENT MAY BE LEFT IN PLACE. FLOOR DEVICES SHALL BE PROVIDED WITH PERMANENT BLANK, FLUSH, REMOVABLE OR HINGED COVER.

9.003 WHERE RACEWAYS ARE ROUTED THROUGH NON-REMOVABLE WALLS, CEILINGS, OR TRAVERSE THROUGH PORTIONS OF THE AIRPORT TO REMAIN IN OPERATION DURING CONSTRUCTION MAY BE ABANDONED IN PLACE. ALL WIRING SHALL BE REMOVED, AND ALL PORTIONS OF THE RACEWAY ROUTED THROUGH UTILITY SPACES, OR AREAS WITHIN THE BOUNDS OF CONSTRUCTION LIMITS SHALL BE REMOVED.

9.004 MCP1 PDP TO REMAIN TO SERVE EXISTING CONVEYORS AND EQUIPMENT TO REMAIN, ALL WIRING FROM MCP1 TO LOADS TO BE REMOVED/RELOCATED SHALL BE BY BHS.

9.005 ALL RACEWAYS SERVING TSA LOADS, LIGHTING AND POWER DEVICES INSTALLED UNDER SLAB OR UNDER CANOPY TO BE REMOVED BY DIV 26 BACK TO SOURCE. UNDER SLAB RACEWAYS EXTENDING UNDER BUILDING OR SLABS TO REMAIN SHALL HAVE WIRING REMOVED, RACEWAYS CUT, CAPPED, AND ABANDONED IN PLACE.

9.006 UNDER FLOOR RACEWAY SYSTEM, BASIS OF DESIGN LEGRAND WALKERDUCT SERIES. PROVIDE NO. 2 DUCT, 3.34 SQ IN. MIN., FOR LOW VOLTAGE (WIRING BY OTHERS) AND NO. 4 DUCT, 8.72 SQ IN. MIN., FOR POWER WIRING, ALIGNMENT CLIP FOR SPACING, END CAPS AND JUNCTION BOXES AS RECOMMENDED BY MANUFACTURER INSTRUCTIONS. COORDINATE INSTALL WITH STRUCTURAL CONTRACTOR, INSTALL AND LEVEL AS REQUIRED. SECURE LEGS TO REBAR OR INTO COMPACTED EARTH TO PREVENT MOVEMENT DURING CONCRETE POUR

9.007 PROVIDE MANUFACTURERS RECOMMENDED CONDUIT ENTRANCE FITTING OR JUNCTION BOX TO ACCOMMODATE RACEWAYS INDICATED. ALL UNDERGROUND RACEWAYS SHALL BE SCHEDULE 80 PVC.

9.008 (TYP) ALL FLOOR BOXES SHOWN SHALL CONSIST OF A SHARED, DIVIDED FLOOR BOX OR TWO SEPARATE FLOOR BOXES TAPPED INTO BOTH LOW VOLTAGE UNDERGROUND DUCT AND LINE VOLTAGE UNDERGROUND DUCT. PROVIDE JUNCTION BOX SIZES AS REQUIRED FOR DEVICE(S) INDICATED ON EQUIPMENT SCHEDULE. FLOOR BOX TAPPED INTO LOW VOLTAGE UNDERGROUND DUCT SHALL BE PROVIDED WITH A BLANK COVER AND LARGE ENOUGH TO ACCOMMODATE FOUR (4) DEVICES. ALL FLOOR BOXES SHALL BE FLUSH ACTIVATION TYPE.

9.009 NO. 4 UNDERFLOOR DUCT WITH NO PRESETS MAY BE PROVIDED IN LIEU UNDERGROUND RACEWAYS

9.010 COORDINATE FIXTURE LOCATION WITH DESTRATIFICATION FAN, DO NOT LOCATE LIGHTS DIRECTLY UNDER FAN

9.011 INTERCEPT EMERGENCY CIRCUIT FROM EXISTING PANEL L1YB-1 AND EXTEND TO NEW ADDITION. THIS CIRCUIT SHALL BE WIRED TO ALL FIXTURES IDENTIFIED AS "EMERGENCY". INCLUDING ALL EXIT SIGNS. FIELD LOCATE AND EXTEND UNSWITCHED HOT CONDUCTOR THAT BYPASSES RELAY FROM CIRCUIT PROVIDING NORMAL POWER TO FIXTURE (L1MB-1) AND WIRE TO FIXTURE POWER TRANSFER DEVICE

9.012 INTERCEPT NORMAL POWER CIRCUIT, L1MB-1, UPSTREAM ALL CONTROL DEVICES IN ROOM, MAINTAIN WIRING FROM RELAY IN L1RB. EXISTING RELAY TIME CLOCK CONTROLS SHALL BE EXTENDED TO AREA OF NEW WORK. EXTEND TO NEW ADDITION. UNLESS NOTED, ALL NORMAL POWER FOR LIGHT FIXTURES IN BAGGAGE HANDLING ADDITION SHALL BE POWERED FROM THIS CIRCUIT.

9.013 EXISTING CIRCUIT L1MB-8 SERVING NORMAL LIGHTS REMOVED FROM EXISTING CANOPY VIA RELAY PANEL L1RB TO BE EXTENDED FROM UPSTREAM ALL CONTROL DEVICES TO NEW CANOPY LIGHTING. EXISTING TIME CLOCK AND PHOTOCELL OPERATION OF EXTERIOR FIXTURES IN EXISTING RELAY GROUP TO BE MAINTAINED. ALL CANOPY MOUNTED FIXTURES SHALL BE POWERED FROM THIS CIRCUIT UNLESS NOTED.

9.014 EXISTING EMERGENCY CIRCUIT L1YR-4 TO BE EXTENDED TO FIXTURES NOTED. MAINTAIN CONTROLS FUNCTIONALITY FROM EXISTING RELAY GROUP IN RELAY PANEL L1RB.

9.015 MOUNT RECEPTACLE ON CANOPY COLUMN. PROVIDE WHILE-IN-USE STYLE COVER WITH WATER TIGHT FITTINGS. ROUTE RACEWAY UNDERGROUND, TRANSITION TO RMC WITHIN 3'-0" OF THE COLUMN, PROVIDE STRAP TYPE SUPPORT FOR BOX AND RACEWAY. DO NOT TAP OR DRILL COLUMN WITHOUT APPROVAL FROM STRUCTURAL ENGINEER.

9.016 MOUNT RECEPTACLE ON GUARD RAIL. COORDINATE LOCATION WITH BAGGAGE HANDLING CONTRACTOR. LOCATE RECEPTACLE BACKBOX WITH WHILE-IN-USE COVER ON THE INSIDE OF THE GUARDRAIL TO PROTECT FROM TUG COLLISION DAMAGE. ROUTE ALL CONDUITS ON INTERIOR SIDE OF GUARD RAIL. ALL EXTERIOR RACEWAYS SHALL BE RMC TYPE.

9.017 PENDANT MOUNT SENSOR FROM STRUCTURE ABOVE

Mead & Hunt

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Suite 330
Ontario, CA 91761
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT

M&H NO.: 1943000-222814.02
DATE: September 30, 2025
DESIGNED BY: RJV
DRAWN BY: RJV
CHECKED BY: JRH
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ELECTRICAL KEYED NOTES

SHEET NO.:
E-005

2/24/2026 3:46:38 PM C:\Revit Local\222814.02-E-R24_Richard.vojtisek.rvt

Electrical Power Distribution Mandatory Measures:

110.12(a) DEMAND RESPONSIVE (DR) CONTROLS
ALL DEMAND RESPONSIVE CONTROLS SHALL:

1. BE EITHER A. CERTIFIED OPENADR 2.0a OR OPENADR 2.0b VIRTUAL END NODE (VEN); OR B. CERTIFIED BY THE MANUFACTURER AS BEING CAPABLE OF RESPONDING TO A DR SIGNAL FROM A CERTIFIED OPENADR 2.0b VEN AUTOMATICALLY IMPLEMENTING THE CONTROL FUNCTIONS REQUESTED BY THE VEN FOR THE EQUIPMENT IT CONTROLS.
2. BE CAPABLE OF COMMUNICATING USING ONE OR MORE OF THE FOLLOWING: WI-FI, ZIGBEE, BACNET, ETHERNET, OR HARD-WIRING.
3. CONTINUE TO PERFORM ALL OTHER CONTROL FUNCTIONS PROVIDED BY THE CONTROL WHEN COMMUNICATIONS ARE DISABLED OR UNAVAILABLE.
4. DR CONTROL THERMOSTATS SHALL COMPLY WITH REFERENCE JOINT APPENDIX 5 (JA5), TECHNICAL SPECIFICATIONS FOR OCCUPANT CONTROLLED SMART THERMOSTATS.

110.12(d) DEMAND RESPONSIVE ELECTRONIC MESSAGE CENTER CONTROL
CONTROLS FOR ELECTRONIC MESSAGE CENTERS GREATER THAN 15KW SHALL BE CAPABLE OF REDUCING THE LIGHTING POWER BY A MINIMUM OF 30% WHEN RECEIVING A DR SIGNAL.

130.5(c) VOLTAGE DROP
THE MAXIMUM COMBINED VOLTAGE DROP ON BOTH INSTALLED FEEDER AND BRANCH CIRCUIT CONDUCTORS TO THE FARTHEST CONNECTED LOAD OR OUTLET SHALL NOT EXCEED 5%.

This document is used to demonstrate compliance with mandatory requirements in 130.5, for electrical systems in newly constructed nonresidential and hotel/motel occupancies and 160.6 and 160.9 for electrical systems in newly constructed multifamily occupancies. Additions and alterations to electrical service systems in nonresidential and hotel/motel occupancies will also use this document to demonstrate compliance per 141.0(a) or 141.0(b)2P for alterations. For multifamily addition or alterations compliance will be documented per 180.1(a) or 180.2 (b)4Bvii

A. GENERAL INFORMATION

01	Project Location (city)	San Luis Obispo	02	Climate Zone	5
			03	Occupancy Types Within Project:	All Other OccupanciesCommercial Industrial

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Scope of Work[1]	Rating[2] (kVA)	Utility Provided Metering System Exception to 130.5(a)/ 160.6(a)[3]	System subject to CA Elec Code Article 517 Exception to 130.5(a)and (b)	Demand Response Controls	Provides power to dwelling units/common living areas only in multifamily occupancy
See sheet E-100, meter located in main switchboard lineup in main electrical room, plan North East	Add/Alt to feeders and branch circuits only	---	☐	☐	Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections 120.2/ 160.3, 130.1/ 160.5, and 130.3/ 160.5, and mechanical, indoor lighting, and sign lighting Certificate of Compliance documents will indicate when demand response controls are required.	☐

[2] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c)/160.6(c), no other requirements from 130.5/160.6 are required.
[2] If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.
[3] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through J. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05	06
Service Electrical Metering 130.5(a)/ 160.6(a) (See Table F)	AND	Separation for Monitoring 130.5(b)/ 160.6(b) (See Table G)	AND	Voltage Drop 130.5(c)/ 160.6(c) (See Table H)	AND	Controlled Receptacles 130.5(d)/ 160.6(d) (See Table I)	Electric Ready 160.9 (See Table J)	**Compliance Results**
	AND		AND	Yes	AND			COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with 130.5(c)/ 160.6(c). For alterations, only the altered circuits must demonstrate compliance per 141.0(b)2Pii/ 180.2(b)4Bviic.

01	02		03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method		Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
					Pass	Fail
See sheet E-100, meter located in main switchboard lineup in main electrical room, plan North East	☒ Voltage drop less than 5%	☐ Permitted by CA Elec Code (Exception to 130.5(c))*	In construction documents	E-014	☐	☐

** NOTES: If "Permitted by CA Elec Code *" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

K. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-ELC-E - Must be submitted for all buildings

L. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no forms required for this project.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Richard Vojtisek	
Company: Mead And Hunt	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Richard Vojtisek	
Company: Mead And Hunt	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Mead & Hunt, Inc.
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.
975 AIRPORT DRIVE, SUITE 1
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M&H NO.: 1943000-222814.02
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DO NOT SCALE DRAWINGS

SHEET CONTENTS
CAL GREEN CHECKLIST

SHEET NO.:
E-010

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Indoor Lighting Mandatory Measures:

110.9 LIGHTING CONTROLS AND COMPONENTS
ALL LIGHTING CONTROL DEVICES AND SYSTEMS, AND ALL LIGHT SOURCES SHALL MEET THE APPLICABLE REQUIREMENTS OF 110.9.

NOTE: THE EXCEPTED SPACES DO NOT COUNT TOWARDS THE 10,000 FT2 THRESHOLD.

130.0 GENERAL LUMINAIRE REQUIREMENTS
ALL LUMINAIRES SHALL BE FACTORY-LABELLED PER 130.0(c).
ENERGY MANAGEMENT CONTROL SYSTEMS (EMCS) SHALL MEET REQUIREMENTS OF 130.0(e).

130.1(a) MANUAL AREA CONTROLS
EACH ROOM OR AREA WITH FLOOR-TO-CEILING WALLS IN THIS BUILDING SHALL HAVE LIGHTING CONTROLS THAT ALLOW LIGHTING TO BE MANUALLY TURNED ON AND OFF MANUAL CONTROLS SHALL:

1. BE READILY ACCESSIBLE

2. BE LOCATED IN THE SAME ENCLOSED AREA WITH THE LIGHTING IT CONTROLS.

3. PROVIDE SEPARATE CONTROL OF GENERAL, FLOOR, WALL, WINDOW CASE DISPLAY, ORNAMENTAL AND SPECIAL EFFECTS LIGHTING SO EACH TYPE CAN BE TURNED ON AND OFF SEPARATELY WITHOUT AFFECTING OTHER LIGHTING OR EQUIPMENT.

130.1(b) MULTILEVEL LIGHTING CONTROLS
GENERAL LIGHTING IN ALL ROOMS AND AREAS 100 FT2 OR GREATER AND WITH MORE THAN 0.5 WATTS PER FT2 OF LIGHTING LOAD SHALL HAVE MULTILEVEL CONTROLS THAT ALLOW LIGHT LEVELS TO BE ADJUSTED UP AND DOWN. CONTROLS SHALL PROVIDE NUMBER OF CONTROL STEPS AND UNIFORM ILLUMINANCE LIGHT LEVELS PER TABLE 130.1-A.

130.1(c): SHUTOFF CONTROLS
ALL INSTALLED INDOOR LIGHTING SHALL BE EQUIPPED WITH CONTROLS TO AUTOMATICALLY REDUCE LIGHTING POWER WHEN SPACE IS TYPICALLY UNOCCUPIED.

130.1(c)1: CONTROL REQUIREMENTS
ALL INSTALLED INDOOR LIGHTING SHALL HAVE ALL OF THE FOLLOWING:
A. CONTROL(S) CAPABLE OF AUTOMATICALLY SHUTTING OFF ALL LIGHTING IN THE SPACE WHEN TYPICALLY UNOCCUPIED (OCCUPANT SENSING CONTROL, AUTOMATIC TIME-SWITCH CONTROL, OR OTHER)
B. SEPARATE CONTROLS FOR LIGHTING ON EACH FLOOR (OTHER THAN STAIRWELLS)

C. SEPARATE CONTROLS FOR A SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS NOT EXCEEDING 5,000 FT2

130.1(c)6 PARTIAL OR FULL-OFF OCCUPANT SENSORS
PROVIDE PARTIAL OR FULL-OFF OCCUPANT SENSORS, IN ADDITION TO SHUTOFF CONTROLS PER 130.1(c)1 AND 130.1(c)2, IN THE FOLLOWING SPACES:

- AISLE WAYS AND OPEN AREAS IN WAREHOUSES
- LIBRARY BOOK STACK AISLES
- CORRIDORS AND STAIRWELLS
- OFFICES GREATER THAN 250 SQ. FT.

CERTIFICATE OF COMPLIANCE **NRCC-LTI-E**
This document is used to demonstrate compliance with requirements in 110.9, 110.12(c), 130.0, 130.1, 140.6 and 141.0(b)2 for indoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e) and 180.2(b)4 for indoor lighting scopes using the prescriptive path for multifamily occupancies. Multifamily includes dormitory and senior living facilities.

Project Name:	SBP Baggage Expansion	**Report Page:**	**(Page 1 of 8)**
Project Address:		**Date Prepared:**	2024-05-17T13:04:27-04:00

A. GENERAL INFORMATION

01	Project Location (city)	San Luis Obispo	04	Total Conditioned Floor Area (ft²)	3,770
02	Climate Zone	5	05	Total Unconditioned Floor Area (ft²)	0
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	1

● Commercial Industrial ● Support Areas ● All Other Occupancies

B. PROJECT SCOPE
This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.6 / 170.2(e) or 141.0(b)2 / 180.2(b)4 for alterations.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☒ New Lighting System	Area Category Method	2900	N/A	0
☐ New Lighting System - Parking Garage	N/A	0	N/A	0
☒ Altered Lighting System	Area Category Method	870	N/A	0
Total Area of Work (ft²)	3770			

CERTIFICATE OF COMPLIANCE			**NRCC-LTI-E**
Project Name:	SBP Baggage Expansion	**Report Page:**	**(Page 2 of 8)**
		Date Prepared:	2024-05-17T13:04:27-04:00

C. COMPLIANCE RESULTS
If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per 140.6(b)1 / 170.2(e)	Allowed Lighting Power per 140.6(b) / 170.2(e) (Watts)						Adjusted Lighting Power per 140.6(a) / 170.2(e) (Watts)				Compliance Results
	01	02	03	04		05	06	07 Adjustments		08	09
	Complete Building 140.6(c)1	Area Category 140.6(c)2 / 170.2(e)4	Area Category Additional 140.6(c)2G / 170.2(e)4Av (+)	Tailored 140.6(c)3 / 170.2(e)4B (+)	=	**Total Allowed** (Watts)	≥ Total Designed (Watts)	PAF Lighting Control Credits 140.6(a)2 / 170.2(e)1B (-)	=	**Total Adjusted** (Watts) *Includes Adjustments	**05 must be >= 08 140.6 / 170.2(e)**
	(See Table I)	(See Table I)	(See Table J)	(See Table K)			(See Table F)	(See Table P)			
Conditioned		2,262			=	2,262	≥ 1,700	255	=	1445	COMPLIES
Unconditioned					=		≥		=		
Controls Compliance (See Table H for Details)											COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)											

D. EXCEPTIONAL CONDITIONS
This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS
This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

Indoor Lighting Mandatory Measures:

130.1(d) AUTOMATIC DAYLIGHTING CONTROLS
ALL GENERAL LIGHTING IN THE FOLLOWING ZONES SHALL HAVE CONTROLS THAT AUTOMATICALLY ADJUST THE INSTALLED LIGHTING POWER UP AND DOWN TO KEEP TOTAL LIGHT LEVEL STABLE AS INCOMING DAYLIGHT CHANGES:

- PRIMARY SIDELIT DAYLIT ZONES
- SECONDARY SIDELIT DAYLIT ZONES
- COMBINED PRIMARY AND SECONDARY SIDELIT DAYLIT ZONES IN PARKING GARAGES

ALL DAYLIT ZONES MUST BE SHOWN ON PLANS.

NOTE: PARKING AREAS ON THE ROOF OF A PARKING STRUCTURE ARE NOT SKYLIT DAYLIT AREAS.

IN ADDITION, AUTOMATIC DAYLIGHTING CONTROLS SHALL PROVIDE SEPARATE CONTROL FOR LUMINAIRES IN EACH TYPE OF DAYLIT ZONE. LUMINAIRES THAT FALL IN BOTH SKYLIT AND SIDELIT DAYLIT ZONE SHALL BE CONTROLLED AS PART OF THE SKYLIT ZONE.

130.1(d)3 THE AUTOMATIC DAYLIGHTING CONTROLS SHALL ACHIEVE ALL OF THE FOLLOWING:
A. ADJUST LIGHTING VIA CONTINUOUS DIMMING OR THE NUMBER OF CONTROL STEPS PROVIDED BY THE MULTILEVEL CONTROLS (FOR SPACES REQUIRED TO INSTALL MULTILEVEL CONTROLS UNDER SECTION 130.1(b)).

B. FOR EACH SPACE, ENSURE COMBINED ILLUMINANCE FROM CONTROLLED LIGHTING AND DAYLIGHT IS NOT LESS THAN ILLUMINANCE FROM CONTROLLED LIGHTING WHEN NO DAYLIGHT IS AVAILABLE.

C. ENSURE THAT THE GENERAL LIGHTING POWER IN A DAYLIT ZONE SHALL BE REDUCED BY AT LEAST 90% WHEN DAYLIGHT ILLUMINANCE IN THAT ZONE IS GREATER THAN 150% OF DESIGN ILLUMINANCE RECEIVED FROM THE GENERAL LIGHTING SYSTEM AT FULL POWER (NOT APPLICABLE TO PARKING GARAGES).

D. (FOR PARKING GARAGES ONLY) ENSURE THAT WHEN ILLUMINANCE LEVELS MEASURED AT THE FARTHEST EDGE OF THE SECONDARY SIDELIT ZONE AWAY FROM GLAZING OR OPENING ARE GREATER THAN 150% OF THE ILLUMINANCE PROVIDED BY THE CONTROLLED LIGHTING WHEN NO DAYLIGHT IS AVAILABLE, THE CONTROLLED LIGHTING POWER IN THE COMBINED PRIMARY AND SECONDARY SIDELIT DAYLIT ZONES SHALL BE REDUCED BY 100%.

130.1(d)4 WHEN PHOTOSENSORS ARE LOCATED WITHIN THE DAYLIT ZONE, AT LEAST ONE PHOTOSENSOR SHALL BE LOCATED SO THAT IT IS NOT READILY ACCESSIBLE TO UNAUTHORIZED PERSONNEL.

130.1(d)5 THE LOCATION WHERE CALIBRATION ADJUSTMENTS ARE MADE TO AUTOMATIC DAYLIGHTING CONTROLS SHALL BE READILY ACCESSIBLE TO AUTHORIZED PERSONNEL BUT MAY BE INSIDE A LOCKED CASE OR UNDER A COVER THAT REQUIRES A TOOL FOR ACCESS.

Indoor Lighting Mandatory Measures:

130.1(f) CONTROL INTERACTIONS
EACH LIGHTING CONTROL INSTALLED TO MEET 130.1 REQUIREMENTS SHALL INCORPORATE THE FUNCTIONS OF OTHER LIGHTING CONTROLS REQUIRED BY THIS SECTION.

1. FOR GENERAL LIGHTING, MANUAL AREA CONTROL SHALL PERMIT THE LEVEL OF LIGHT PROVIDED WHILE LIGHTING IS ON TO BE SET OR ADJUSTED BY CONTROLS SPECIFIED IN 130.1(b), (c), (d) and (e).

2. MANUAL AREA CONTROL SHALL PERMIT SHUTOFF CONTROL TO TURN THE LIGHTING DOWN OR OFF.

3. MULTILEVEL CONTROL SHALL PERMIT THE AUTOMATIC DAYLIGHTING CONTROL TO ADJUST ELECTRIC LIGHTING IN RESPONSE TO DAYLIGHT.

4. MULTILEVEL CONTROL SHALL PERMIT THE DEMAND RESPONSIVE (DR) CONTROL TO ADJUST LIGHTING DURING A DR EVENT THEN RETURN IT TO THE LEVEL SET BY THE CONTROL AFTER THE EVENT.

5 SHUTOFF CONTROL SHALL PERMIT THE MANUAL AREA CONTROL TO TURN THE LIGHTING ON.

6. AUTOMATIC DAYLIGHTING CONTROL SHALL PERMIT MULTILEVEL LIGHTING CONTROL TO ADJUST THE LIGHTING LEVEL.

7. FOR LIGHTING CONTROLLED BY MULTILEVEL LIGHTING CONTROLS AND OCCUPANT SENSING CONTROLS THAT PROVIDE AUTOMATIC-ON FUNCTION, CONTROLS SHALL PROVIDE A PARTIAL-ON FUNCTION THAT IS CAPABLE OF AUTOMATICALLY ACTIVATING BETWEEN 50-70% OF CONTROLLED LIGHTING POWER.

8. RESERVED

9. FOR SPACE CONDITIONING SYSTEM ZONES SERVING ONLY SPACES THAT ARE REQUIRED TO HAVE OCCUPANT SENSING CONTROLS SHALL BE CONTROLLED BY OCCUPANCY SENSING CONTROLS.

CERTIFICATE OF COMPLIANCE			**NRCC-LTI-E**
Project Name:	58P Baggage Expansion	**Report Page:**	**(Page 3 of 8)**
		Date Prepared:	2024-05-17T13:04:27-04:00

F. INDOOR LIGHTING FIXTURE SCHEDULE
This table includes all planned permanent and portable lighting other than dwelling unit/ hotel/ motel room lighting. Multifamily dwelling unit and hotel/motel room lighting is documented in Table T. If using Table T to document lighting in multifamily common use areas providing shared provisions for living, eating, cooking or sanitation, those luminaires are not included here.

Designed Wattage: Conditioned Spaces

01	02	03	04	05	06	07	08	09	10	
									Field Inspector	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per 140.6(a)3 / 170.2(e)2C	Design Watts	Pass	Fail
G1 and G1E	4FT LED INDUSTRIAL GASKETTED PENDANT, IP65, 10% 0-10V DIM, ACRYLIC LINEAL RUBBED FROSTED LENS, 90CRI (G1E W/ PT DEVICES FOR EM FIXTURES)	No	NA	100	Mfr. Spec	17	No	1,700	☐	☐
X1	WALL MOUNT EXIT SIGN, STEEL HOUSING, RED LETTERING, NO ARROW WITH INTEGRAL BATTERY AND INTEGRAL LED HEADS	No	NA	6.6	Mfr. Spec	3	Exempt	---	☐	☐
							Total Designed Watts: CONDITIONED SPACES	1,700		

[1] *FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per 140.6(a)4B / 170.2(e)2D is adjusted to be 75% /80% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2] *Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b). Wattage used must be the maximum rated for the luminaire, not the lamp.*

G. MODULAR LIGHTING SYSTEMS
This section does not apply to this project.

CERTIFICATE OF COMPLIANCE			**NRCC-LTI-E**
Project Name:	SBP Baggage Expansion	**Report Page:**	**(Page 4 of 8)**
		Date Prepared:	2024-05-17T13:04:27-04:00

H. INDOOR LIGHTING CONTROLS (Not including PAFs)
This table includes lighting controls for conditioned and unconditioned spaces.

Building Level Controls

01	02	03	
		Field Inspector	
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C	Pass	Fail
NA < 4,000W subject to multilevel	See Area/Space Level Controls	☐	☐

Area Level Controls

04	05	06	07	08	09	10	11	12	
								Field Inspector	
Area Description	Complete Building or Area Category Primary Function Area	Manual Area Controls 130.1(a) / 160.5(b)4A	Multi-Level Controls 130.1(b) / 160.5(b)4B	Shut-Off Controls 130.1(c) // 160.5(b)4C	Primary/Sky lit Daylighting 130.1(d) / 160.5(b)4D	Secondary Daylighting 130.1(d) / 160.5(b)4D	Interlocked Systems 140.6(a)1/ 170.2(e)2A	Pass	Fail
Building addition - baggage handling and screening room	General Commercial Industrial Work AreaLow Bay	Auth. Personnel	Dimmer	Occupancy Sensor	Included	Included	No	☐	☐
Existing Bag Screening room 101 controls alteration	General Commercial Industrial Work AreaLow Bay	Auth. Personnel	Dimmer	See Building Level	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
							13		
							Plan Sheet Showing Daylit Zones:		
							E-122		

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS
Each area complying using the Complete Building or Area Category Methods per 140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per 140.6(c) or adjustments per 140.6(a) are being used .

Conditioned Spaces

01	02	03	04	05	06

CERTIFICATE OF COMPLIANCE			**NRCC-LTI-E**
Project Name:	SBP Baggage Expansion	**Report Page:**	**(Page 5 of 8)**
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I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowance / Adjustment	
					Area Category	PAF
Building addition - baggage handling and screening room	General Commercial Industrial Work AreaLow Bay	0.6	2,900	1,740	No	Yes
Existing Bag Screening room 101 controls alteration	General Commercial Industrial Work AreaLow Bay	0.6	870	522	No	No
		TOTALS:	3,770	2,262	See Tables J, or P for detail	

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM
This section does not apply to this project.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE
This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY
This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING
This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED DECORATIVE /SPECIAL EFFECTS
This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE
This section does not apply to this project.

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975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED:
09/03/25 ISSUED FOR PERMIT

M&H NO.: 1943000-222814.02
DATE: September 30, 2025
DESIGNED BY: RJV
DRAWN BY: RJV
CHECKED BY: JRH
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CAL GREEN CHECKLIST

SHEET NO.:
E-011

2/24/2026 3:46:59 PM C:\Revit Local\222814.02-E-R24_Richard.vojtisek.rvt

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))

This table includes all areas indicated in Table I or Table K as using a PAF credit described in 140.6(a)2 / 170.2(e)2B.

Conditioned Spaces

01	02									03	04	05	06	07
Area Description	PAF per 140.6(a)2 / 170.2(e)2B[1] (*Can be used in conjunction with other PAF'S)									Luminaires Controlled for PAF Credit				Additional Control Credit Allowance (Watts)
	1	2A	2B	3A*	3B*	4*	5*	6*	7*	Luminaire Name or Item Tag	Luminaire Design Watts	Number of Luminaires	Lighting Controlled (Watts)	
				Pick up to one	Pick up to one		Pick up to one[2]		Pick up to one[2]					
Building addition - baggage handling and screening room	☒	☐	☐	☐	☐	☒	☐	☐	☐	G1 and G1E	100	17	1700	255
08										09				
☐	All spaces applying PAF 5, 6 or 7 include a daylight design meeting requirements in 140.3(d). See Table S.									**Total Power Adjustment (Watts) CONDITIONED SPACES:**				255

[1] FOOTNOTES: PAFs outlined in Table 140.6-A /170.2-L include 1) Daylight continuous dimming plus OFF; 2A) Occupant sensors in offices with one sensor per <= 125 ft²; 2B) Occupant sensors in offices with one sensor per 126 - 250 ft²; 3A) Institutional tuning, non-daylit areas and 3B) Institutional tuning, daylit areas; 4) Demand response; 5) Clerestory fenestration; 6) Horizontal slats; 7) Light shelves.

[2] Luminaires that qualify for PAF 5, 6, or 7 can be used in conjunction with PAF 1.

Q. RATED POWER REDUCTION COMPLIANCE FOR ONE-FOR-ONE ALTERATIONS

This section does not apply to this project.

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS

This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)

This section does not apply to this project.

T. DWELLING UNIT LIGHTING

This section does not apply to this project.

U. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selections have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTI-E - Must be submitted for all buildings

V. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selections have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	Building addition - baggage handling and screening room
NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	Building addition - baggage handling and screening room

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Richard Vojtisek	Documentation Author Signature:
Company: Mead And Hunt	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Richard Vojtisek	Responsible Designer Signature:
Company: Mead And Hunt	Date Signed:
Address:	License:
City/State/Zip:	Phone:

Mead & Hunt
Mead & Hunt, Inc.
3110 E.Guasti Road,
Suite 330
Ontario, CA 91761
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
09/03/25 ISSUED FOR PERMIT

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E-012

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Outdoor Lighting Mandatory Measures:

110.9 OUTDOOR LIGHTING CONTROLS AND COMPONENTS
ALL LIGHTING CONTROL DEVICES AND SYSTEMS, AND ALL LIGHT SOURCES SHALL MEET THE APPLICABLE REQUIREMENTS OF 110.9.

130.0 GENERAL LUMINAIRE REQUIREMENTS
ALL LUMINAIRES SHALL BE FACTORY-LABELLED PER 130.0(c).
ENERGY MANAGEMENT CONTROL SYSTEMS (EMCS) SHALL MEET REQUIREMENTS OF 130.0(e).

130.2(b) LUMINAIRE SHIELDING REQUIREMENTS
ALL OUTDOOR LUMINAIRES WITH INITIAL LUMINAIRE LUMENS >=6,200 SHALL COMPLY WITH THE BACKLIGHT, UPLIGHT AND GLARE (BUG) REQUIREMENTS OF TITLE 24, PART 11, SECTION 5.106.8.

130.2(c) CONTROLS FOR OUTDOOR LIGHTING
ALL OUTDOOR LIGHTING SHALL BE INDEPENDENTLY CONTROLLED FROM OTHER ELECTRICAL LOADS AND SHALL HAVE THE FOLLOWING FEATURES:

1. AUTOMATICALLY TURNS OFF OUTDOOR LIGHTING WHEN DAYLIGHT IS AVAILABLE

2. AUTOMATIC SCHEDULING CONTROLS
   - A. AUTOMATIC SCHEDULING CONTROLS SHALL BE INSTALLED FOR ALL OUTDOOR LIGHTING.
   - B. CAPABLE OF REDUCING LIGHTING POWER AT LEAST 50% AND NO MORE THAN 90% AND SEPARATELY CAPABLE OF TURNING LIGHTING OFF DURING UNOCCUPIED PERIODS
   - C. THAT ALLOW SCHEDULING OF AT LEAST TWO NIGHTTIME PERIODS WITH INDEPENDENT LIGHTING LEVELS (MAY INCLUDE OVERRIDE FOR NO MORE THAN 2 HOURS)

3. MOTION SENSING CONTROLS
   - A. SHALL BE INSTALLED FOR THE FOLLOWING AND MAY BE INSTALLED FOR OTHER OUTDOOR LIGHTING AND IN COMBINATION WITH OTHER OUTDOOR LIGHTING CONTROLS:
     (i) ORNAMENTAL HARDSCAPE, OUTDOOR DINING, OR OUTDOOR SALES FRONTAGE LIGHTING MOUNTED 24 FT ABOVE GRADE OR LOWER
     (ii)WALL MOUNTED LUMINAIRES INSTALLED FOR BUILDING FACADE, ORNAMENTAL HARDSCAPE, OUTDOOR DINING LIGHTING THAT HAVE A BILATERALLY SYMMETRIC DISTRIBUTION (AS DESCRIBED IN THE IES HANDBOOK) MOUNTED 24 FEET OR LESS ABOVE GRADE
   - B. CAPABLE OF REDUCING LIGHTING POWER AT LEAST 50% AND NO MORE THAN 90% AND SEPARATELY CAPABLE OF TURNING LIGHTING OFF DURING UNOCCUPIED PERIODS
   - C. CAPABLE OF DIMMING OR TURNING OFF LIGHTING NO LONGER THAN 15 MINUTES AFTER AREA IS VACATED AND TURNING LIGHTING ON WHEN AREA BECOMES OCCUPIED
   - D. SINGLE SENSORS CAN CONTROL NO MORE THAN 1,500 WATTS OF LIGHTING POWER

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	**(Page 1 of 8)**
Project Address:	**Date Prepared:**	2024-05-17T11:46:20-04:00

This document is used to demonstrate compliance with requirements in 110.9, 130.0, 130.2, 140.7, and 141.0(b)2L for outdoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e)6, 180.1(a) and 180.2(b)4Bv for outdoor lighting scopes using the prescriptive path for multifamily and mixed-use occupancies. Multifamily includes dormitory and senior living facilities.

A. GENERAL INFORMATION

01	Project Location (city)	San Luis Obispo	04	Total Illuminated Hardscape Area (ft²)	0
02	Climate Zone	5			
03	Outdoor Lighting Zone per Title 24 Part 1 10.114 or as designated by Authority Having Jurisdiction (AHJ):				
☐	LZ-0: Very Low - Undeveloped Parkland	☐ LZ-2: Moderate - Urban Clusters	☐ LZ-4: High - Must be reviewed by CA Energy Commission for Approval		
☐	LZ-1: Low - Rural Areas	☒ LZ-3: Moderately High - Urban Areas			
05	Occupancy Types within Project				
● Commercial Industrial ● Support Areas					

B. PROJECT SCOPE

This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv for alterations.

My Project Consists of:

01	02	
☐ New Lighting System	Must Comply with Allowances from 140.7 / 170.2(e)6	
☒ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)?	● Yes ○ No
03	04	05
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method
☐ < 10% ☐ >= 10% and < 50% ☐ >= 50%		

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.

[1] *FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.*

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through N. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv											Compliance Results		
01		02		03		04		05		06		07	08	09
General Hardscape Allowance 140.7(d)1 / 170.2(e)6 (See Table I)	+	Per Application 140.7(d)2 / 170.2(e)6 (See Table J)	+	Sales Frontage 140.7(d)2 (See Table K)	+	Ornamental 140.7(d)2 / 170.2(e)6 (See Table L)	+	Per Specific Area 140.7(d)2 / 170.2(e)6 (See Table M)	OR	Existing Power Allowance 141.0(b)2L / 180.2(b)4Bv (See Table N)	=	**Total Allowed** (Watts)	≥	**Total Actual** (Watts)	**07 must be >= 08**
0	+	---	+	---	+	---	+	1,392	OR	---	=	1,392	≥	48	COMPLIES
												Shielding Compliance (See Table G for Details)			COMPLIES
												Controls Compliance (See Table H for Details)			COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	**(Page 3 of 8)**
	Date Prepared:	2024-05-17T11:46:20-04:00

F. OUTDOOR LIGHTING FIXTURE SCHEDULE

For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per 141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included). Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

Designed Wattage:

01	02		03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description		Watts per luminaire[1, 2]	How is Wattage determined	Total Number Luminaires[2]	Luminaire Status[3]	Excluded per 140.7(a) / 170.2(e)6A	Design Watts	Cutoff Req. > 6,200 initial lumen output 130.2(b) / 160.5(c)1[4]	Field Inspector	
										Pass	Fail
K1E	LED WALL PACK WITH GENERATOR TRANSFER DEVICE, BLACK POWDER COATED FINISH, TITLE 24 COMPLIANT	☐ Linear	12	Mfr. Spec	4	New	☐	48	NA: < 6200 lumens	☐	☐
K2	LED ROUND SURFACE MOUNT, MEDIUM DISTRIBUTION, 0-10V DIMMING, WET LOCATION LISTED, MEDIUM DISTRIBUTION, TITLE 24 COMPLIANT	☐ Linear	58	Mfr. Spec	24	New	☒	---	Provided	☐	☐
							Total Design Watts:		48		

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to 130.2(b)

[1] *FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)*
[2] *For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.*
[3] *Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.*
[4] *Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by 130.2(b)/ 160.5(c)*

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	**(Page 4 of 8)**
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G. SHIELDING REQUIREMENTS (BUG)

This table includes fixtures of >=6,200 initial lumens indicated on Table F as needing to comply with Shielding Requirements. Maximum lumens can be found in Title 24, Part 11, Section 5.106.8.

01	02	03	04	05	06	07	08	09	10	11	12	
Name or Item Tag	Complete Luminaire Description	Backlight Rating[2]			Uplight Rating[2]			Glare Rating (Lumens)[2]			Field Inspector	
		Mounting Height[1]	Max Allowable Backlight Rating[3]	Backlight Rating Per Design	Lighting type	Max Allowable Uplight Rating[3]	Uplight Rating Per Design	Mounting Height[1]	Max Allowable Glare Rating[3]	Glare Rating Per Design	Pass	Fail
K2	LED ROUND SURFACE MOUNT, MEDIUM DISTRIBUTION, 0-10V DIMMING, WET LOCATION LISTED, MEDIUM DISTRIBUTION, TITLE 24 COMPLIANT	2 MH from property line	No Limit	B3	Area Lighting	U0	U0	> 2 MH from property line	G3	G2	☐	☐

[1] *FOOTNOTES: Mounting Height is labeled MH in this table.*
[2] *Authority Having Jurisdiction may ask for Luminaire cut sheets or other documentation to confirm luminaire type, uplight ratings and glare ratings used for compliance per 130.2(b)/ 160.5(c)*
[3] *BUG ratings with a lower number than the 'Max Allowable' are compliant. Ex. If Max Allowable is Bug Rating B4, then B0, B1, B2 and B3 are all compliant.*

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	**(Page 5 of 8)**
	Date Prepared:	2024-05-17T11:46:20-04:00

H. OUTDOOR LIGHTING CONTROLS

This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
Outdoor lighting for nonresidential buildings, parking garages and common service areas in multifamily buildings must be documented separately from outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit

Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings

01	02	03	04	05	
Area Description	Shut-Off 130.2(c)1 / 160.5(c)	Auto-Schedule 130.2(c)2 / 160.5(c)	Motion Sensor 130.2(c)3 / 160.5(c)	Field Inspector	
				Pass	Fail
Canopy lighting for baggage conveyors required to meet FAA guidelines: "K2"	Astronomical Timer	Provided	Provided	☐	☐
Canopy lighting for baggage conveyors required to meet FAA guidelines: "K1E"	Astronomical Timer	Provided	NA: Facade, etc. <=24 ft	☐	☐

[1] *FOOTNOTE: Text has been abbreviated, please refer to Table 160.5-A to confirm compliance with the specific light source technologies listed.*
[2] *Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.*
[3] *Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are excepted from ii and iii.*

I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))

This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/Table 170.2-R while "Use it or lose it" Allowances are per Table 140.7-B /Table 170.2-S. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance. Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

01				
"Use it or lose it" Allowance (select all that apply) (select all that apply)				
☐ General Hardscape Allowance Table I (below)	☐ Per Application Table J	☐ Sales Frontage Table K	☐ Ornamental Table L	☒ Per Specific Area Table M

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	**(Page 6 of 8)**
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J. LIGHTING ALLOWANCE: PER APPLICATION

This section does not apply to this project.

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL

This section does not apply to this project.

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This table includes areas using the wattage allowance per specific area from Table 140.7-B /Table 170.2-S. More than one specific area allowance may be taken in a single project, if applicable. However, multiple specific area allowances may not be taken for the exact same area on the site.

01	02	03	04	05	06	07	08	09	10
Area Description	Specific Area Type per Table 140.7-B	CALCULATED ALLOWANCE (Watts)			DESIGN WATTS				Additional Allowance (Watts)
		Specific Area (ft²)[1]	Allowed Density (W/ft²)	Extra Allowance (Watts)	Luminaire Name or Item Tag	Watts per Luminaire	# of Luminaires	Design Watts	
Canopy lighting for baggage conveyors required to meet FAA guidelines	NonSalesCanopy	5250	0.27	1417.5	K2	58	24	1,392	1392
							Total Design Watts for this Area:		1392	
							Total Allowance (Watts) All Areas:		1392	

[1] *FOOTNOTES: See Table 140.7-B /Table 170.2-S for rules for calculating the specific areas (ft² for these additional lighting allowances.*
[2] *For luminaires indicated in Table F as linear, wattage in column 07 is W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 08 instead of number of luminaires.*

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	**(Page 7 of 8)**
	Date Prepared:	2024-05-17T11:46:20-04:00

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

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Form/Title
NRCI-LTO-E - Must be submitted for all buildings

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

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Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	Canopy lighting for baggage conveyors required to meet FAA guidelines: "K2"; Canopy lighting for baggage conveyors required to meet FAA guidelines: "K1E"

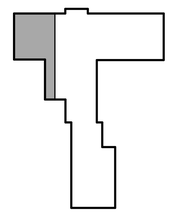
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
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KEY PLAN

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STATE OF CALIFORNIA

Outdoor Lighting

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: SBP Baggage Expansion	**Report Page:**	(Page 8 of 8)
Project Address:	**Date Prepared:**	2024-05-17T11:46:20-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name: Richard Vojtisek	Documentation Author Signature:
Company: Mead And Hunt	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Richard Vojtisek	Responsible Designer Signature:
Company: Mead And Hunt	Date Signed:
Address:	License:
City/State/Zip:	Phone:

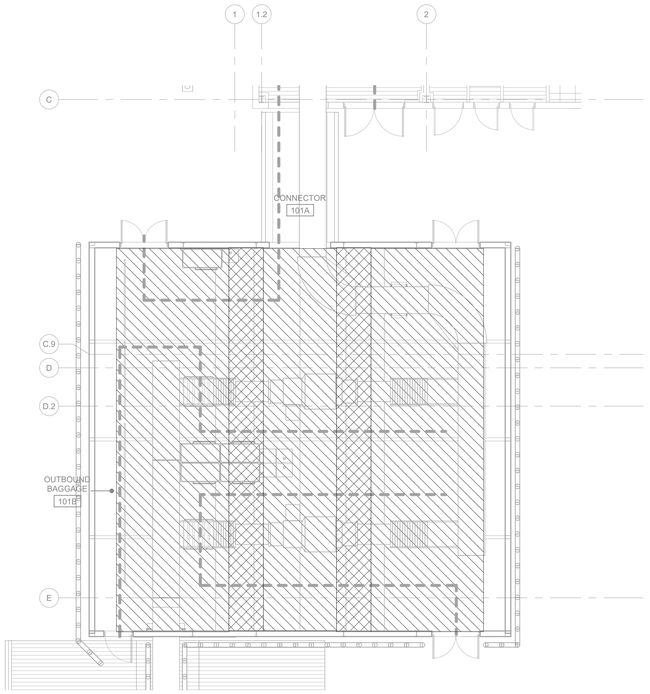
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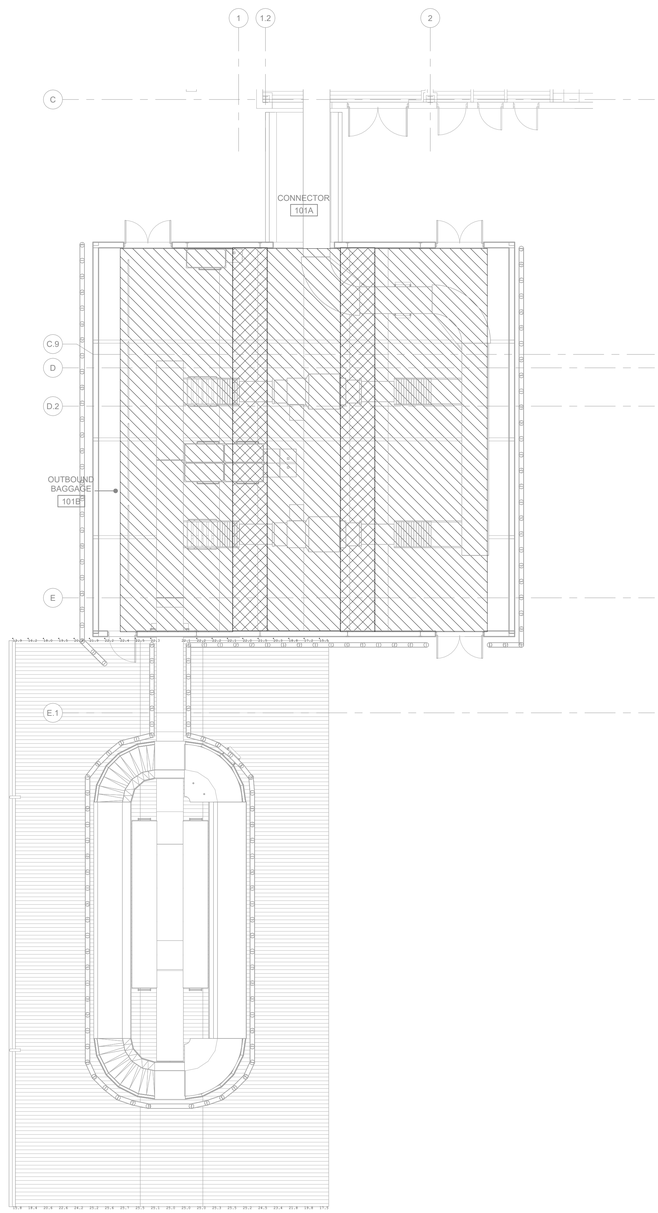
Report Version: 2022.0.000
Schema Version: rev 20220101

Documentation Software: Energy Code Ace

Compliance ID: 190207-0524-0008
Report Generated: 2024-05-17 08:46:23



N 2 **FIRST FLOOR EGRESS LIGHTING PHOTOMETRIC PLAN**
1/8" = 1'-0"



N 1 **FIRST FLOOR LIGHTING PHOTOMETRIC PLAN**
1/8" = 1'-0"

FEEDER VOLTAGE DROP - 2% MAXIMUM VOLTAGE DROP

CIRCUIT/LOAD	DESCRIPTION	VDROP DIST. (FT)		LOAD			RATING		MIN. PHASE CONDUCTOR
		ACTUAL DISTANCE	MAX DIST	KW	FLA (AMPS)	MCA (AMPS)	VOLTS	PHASE	
PANEL	PANEL L1SC	295	462		200	240	480	3	250
XFM Pri	XFMR LB1CC	8	219	30	36.1	43.3	480	3	8
XFM Sec	PANEL L1CC	8	120	30	83.3	100	208	3	3
MCP3 - PDP	BAGGAGE HANDLING CONTROL PANEL	22	274		45	54	480	3	6
MCP4 - PDP	BAGGAGE HANDLING CONTROL PANEL	14	276		67	80.4	480	3	4

BRANCH CIRCUIT VOLTAGE DROP - 3% MAXIMUM VOLTAGE DROP

CIRCUIT/LOAD	DESCRIPTION	VDROP DIST. (FT)		LOAD			RATING		MIN. PHASE CONDUCTOR
		ACTUAL DISTANCE	MAX DIST	KW	FLA (AMPS)	MCA (AMPS)	VOLTS	PHASE	
Typical Lighting	LONGEST RUN / LARGEST LOAD IN...	212	278	2.2	8.8	10.6	277	1	12
L1SC-1	RECEPS	145	176		6	7.2	120	1	12
L1SC-3	RECEPS	129	176		6	7.2	120	1	12
L1SC-5	RECEPS	112	176		6	7.2	120	1	12
L1SC-7,9	EDS	104	135		21	25.2	208	1	10
L1SC-11,13	EDS (F)	84	135		21	25.2	208	1	10
L1SC-15	PVS	100	132		8	9.6	120	1	12
L1SC-17	PVS (F)	87	132		8	9.6	120	1	12
L1SC-19	ETD'S	98	176		6	7.2	120	1	12
L1SC-21	SVS	101	176		6	7.2	120	1	12
L1SC-23	SVS (F)	97	176		6	7.2	120	1	12
L1SC-25	WORK STATIONS	106	353		3	3.6	120	1	12
L1SC-27	WORK STATIONS	111	353		3	3.6	120	1	12
L1SC-29	OVERSIZED BAG SCREEN	80	176		6	7.2	120	1	12
L1SC-31	DF-1	91	176		6	7.2	120	1	12
L1SC-33	RECEPS	203	212		5	6	120	1	12
AHU-1	AIR HANDLING UNIT	74	376		13	15.6	480	3	12

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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

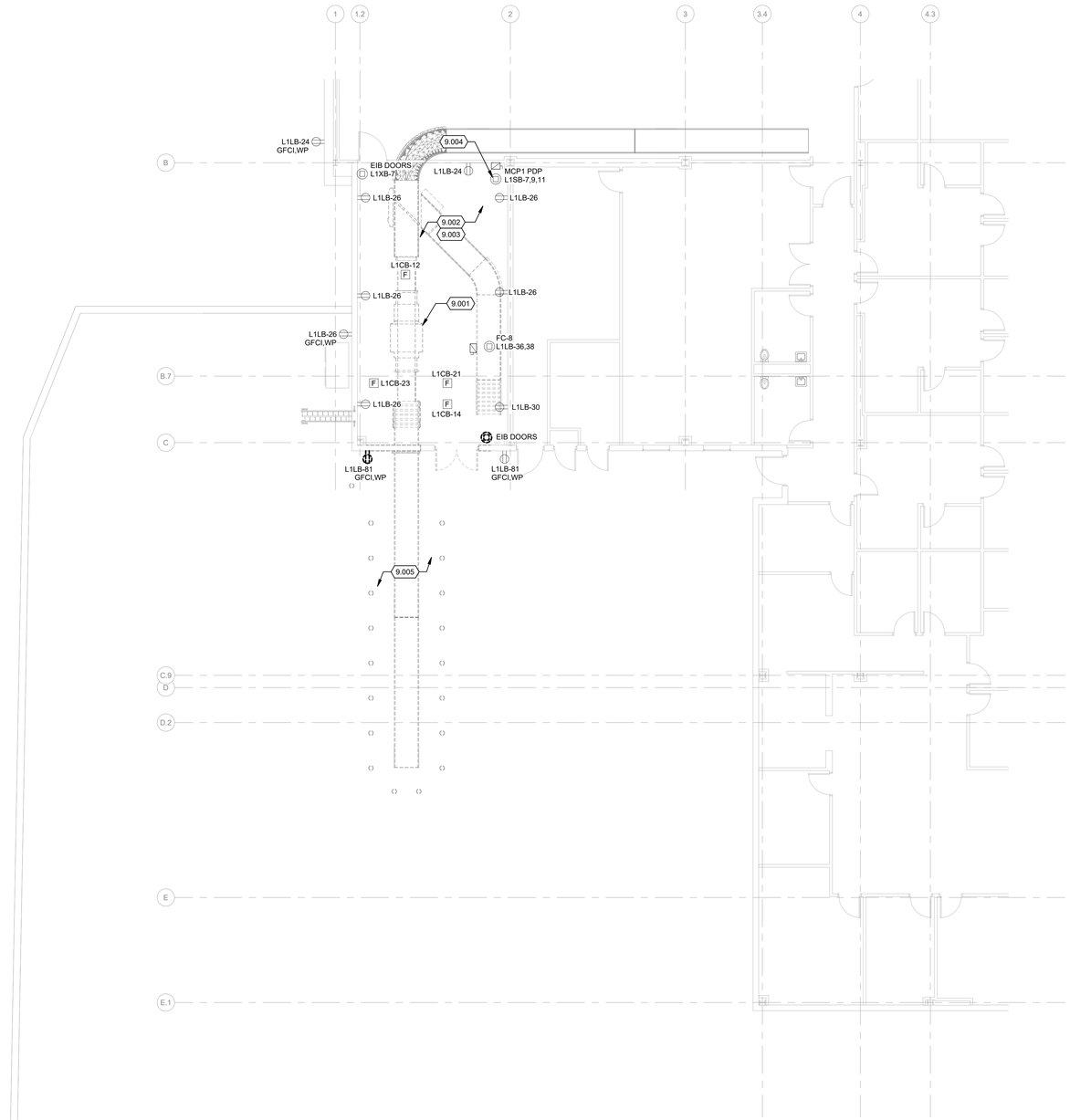
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SHEET CONTENTS
CAL GREEN CHECKLIST

SHEET NO.:
E-014

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N 1 **FIRST FLOOR POWER DEMO PLAN**
1/8" = 1'-0"

DEMOLITION GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ARE BASED ON FIELD INVESTIGATION AND EXISTING DRAWINGS. LOCATIONS, QUANTITIES AND CIRCUIT INFORMATION IS SUBJECT TO FIELD VERIFICATION
2. ALL DEVICES NOTED AS TO BE REMOVED SHALL BE FIELD VERIFIED FOR ADDITIONAL EQUIPMENT, RECEPTACLES, ETC. ON THE SAME CIRCUIT TO REMAIN. CONTRACTOR SHALL PROVIDE BOXES, SPLICES, ETC. TO MAINTAIN CIRCUIT CONTINUITY

KEYED NOTES

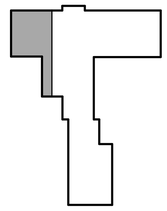
9.001 EQUIPMENT TO BE RE-LOCATED BY BHS CONTRACTOR. FIELD WIRING SHALL BE REMOVED BY DIV 26. REMOVE ALL POWER WIRING FROM EDS MACHINE FROM EQUIPMENT BACK TO SOURCE. WHERE EQUIPMENT IS PLUG AND RECEPTACLE STYLE, WIRING FROM FLOOR BOX TO PANEL MAY REMAIN IN PLACE. FLOOR BOX SHALL BE PROVIDED WITH PERMANENT, BUT REMOVABLE BLANK, FLUSH COVER.

9.002 (TYP) BAGGAGE HANDLING EQUIPMENT WIRED BACK TO MCP SHALL BE REMOVED ENTIRELY BY BHS CONTRACTOR, INCLUDING WIRING. ALL TSA EQUIPMENT WIRING AND RACEWAYS SHALL BE REMOVED BACK TO SOURCE, INCLUDING BUT NOT LIMITED TO WORKSTATIONS, ETD UNITS, AND OTHER EQUIPMENT NOT WIRED TO MCP BY DIV 26. WIRING FOR HARD WIRED EQUIPMENT SHALL BE REMOVED FROM EQUIPMENT, BACK TO ITS SOURCE INCLUDING ALL RACEWAYS, SUPPORTS, ETC. FLUSH WALL OR FLOOR DEVICES SERVING PLUG CONNECTED EQUIPMENT MAY BE LEFT IN PLACE. FLOOR DEVICES SHALL BE PROVIDED WITH PERMANENT BLANK, FLUSH, REMOVABLE OR HINGED COVER.

9.003 WHERE RACEWAYS ARE ROUTED THROUGH NON-REMOVABLE WALLS, CEILINGS, OR TRAVERSE THROUGH PORTIONS OF THE AIRPORT TO REMAIN IN OPERATION DURING CONSTRUCTION MAY BE ABANDONED IN PLACE. ALL WIRING SHALL BE REMOVED, AND ALL PORTIONS OF THE RACEWAY ROUTED THROUGH UTILITY SPACES, OR AREAS WITHIN THE BOUNDS OF CONSTRUCTION LIMITS SHALL BE REMOVED.

9.004 MCP1 PDP TO REMAIN TO SERVE EXISTING CONVEYORS AND EQUIPMENT TO REMAIN, ALL WIRING FROM MCP1 TO LOADS TO BE REMOVED/RELOCATED SHALL BE BY BHS.

9.005 ALL RACEWAYS SERVING TSA LOADS, LIGHTING AND POWER DEVICES INSTALLED UNDER SLAB OR UNDER CANOPY TO BE REMOVED BY DIV 26 BACK TO SOURCE. UNDER SLAB RACEWAYS EXTENDING UNDER BUILDING OR SLABS TO REMAIN SHALL HAVE WIRING REMOVED, RACEWAYS CUT, CAPPED, AND ABANDONED IN PLACE.



KEY PLAN

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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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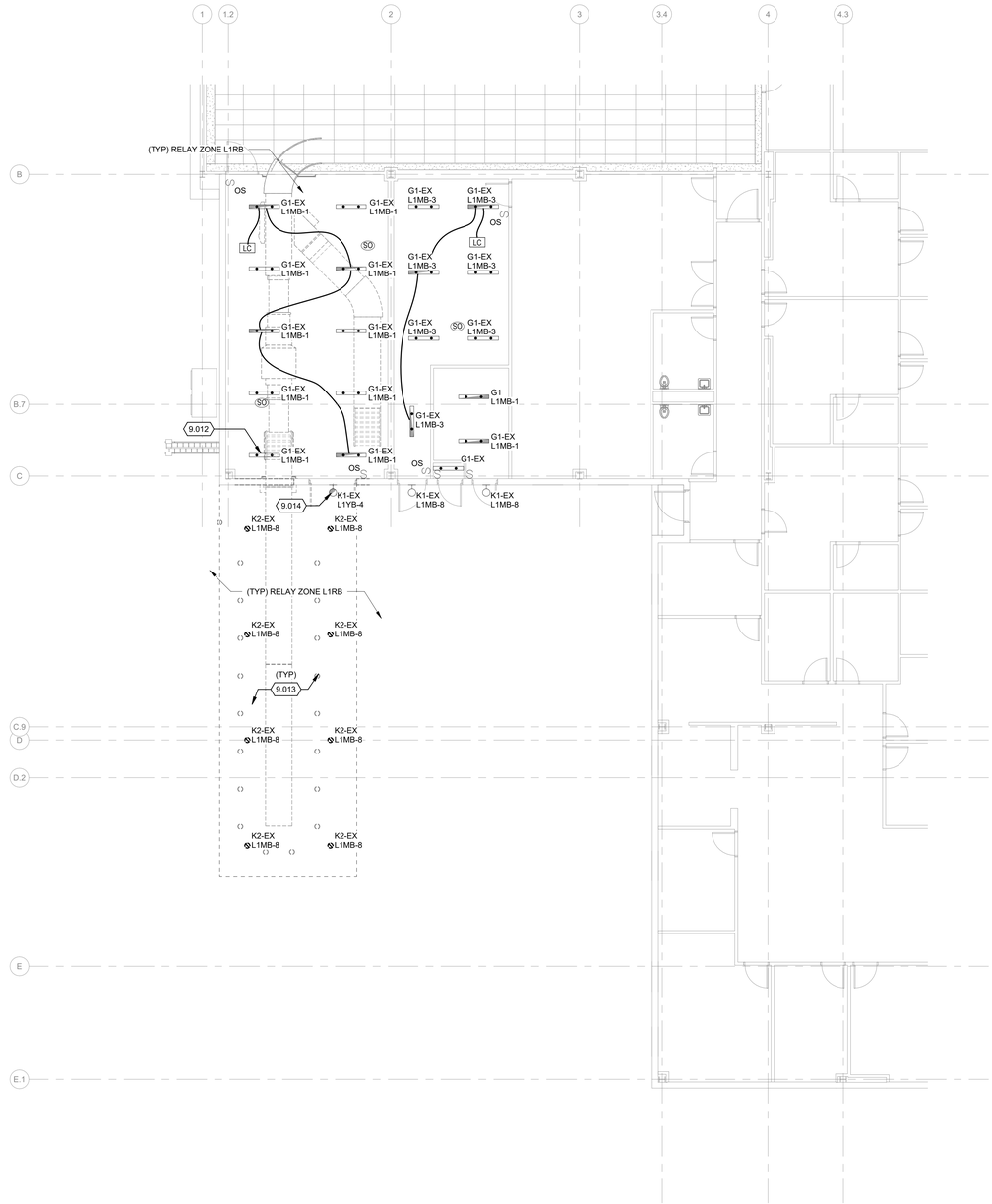
SHEET CONTENTS:
FIRST FLOOR POWER DEMOLITION PLAN

SHEET NO.:
ED101

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DEMOLITION GENERAL NOTES:

1. EXISTING CONDITIONS SHOWN ARE BASED ON FIELD INVESTIGATION AND EXISTING DRAWINGS. LOCATIONS, QUANTITIES AND CIRCUIT INFORMATION IS SUBJECT TO FIELD VERIFICATION
2. ALL DEVICES NOTED AS TO BE REMOVED SHALL BE FIELD VERIFIED FOR ADDITIONAL EQUIPMENT, RECEPTACLES, ETC. ON THE SAME CIRCUIT TO REMAIN. CONTRACTOR SHALL PROVIDE BOXES, SPLICES, ETC. TO MAINTAIN CIRCUIT CONTINUITY



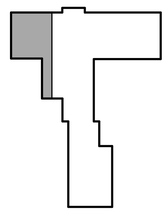
N 1 **FIRST FLOOR LIGHTING DEMO PLAN**
1/8" = 1'-0"

KEYED NOTES

9.012 INTERCEPT NORMAL POWER CIRCUIT, L1MB-1, UPSTREAM ALL CONTROL DEVICES IN ROOM. MAINTAIN WIRING FROM RELAY IN L1RB. EXISTING RELAY TIME CLOCK CONTROLS SHALL BE EXTENDED TO AREA OF NEW WORK. EXTEND TO NEW ADDITION. UNLESS NOTED, ALL NORMAL POWER FOR LIGHT FIXTURES IN BAGGAGE HANDLING ADDITION SHALL BE POWERED FROM THIS CIRCUIT.

9.013 EXISTING CIRCUIT L1MB-8 SERVING NORMAL LIGHTS REMOVED FROM EXISTING CANOPY VIA RELAY PANEL L1RB TO BE EXTENDED FROM UPSTREAM ALL CONTROL DEVICES TO NEW CANOPY LIGHTING. EXISTING TIME CLOCK AND PHOTOCELL OPERATION OF EXTERIOR FIXTURES IN EXISTING RELAY GROUP TO BE MAINTAINED. ALL CANOPY MOUNTED FIXTURES SHALL BE POWERED FROM THIS CIRCUIT UNLESS NOTED.

9.014 EXISTING EMERGENCY CIRCUIT L1YB-4 TO BE EXTENDED TO FIXTURES NOTED. MAINTAIN CONTROLS FUNCTIONALITY FROM EXISTING RELAY GROUP IN RELAY PANEL L1RB.



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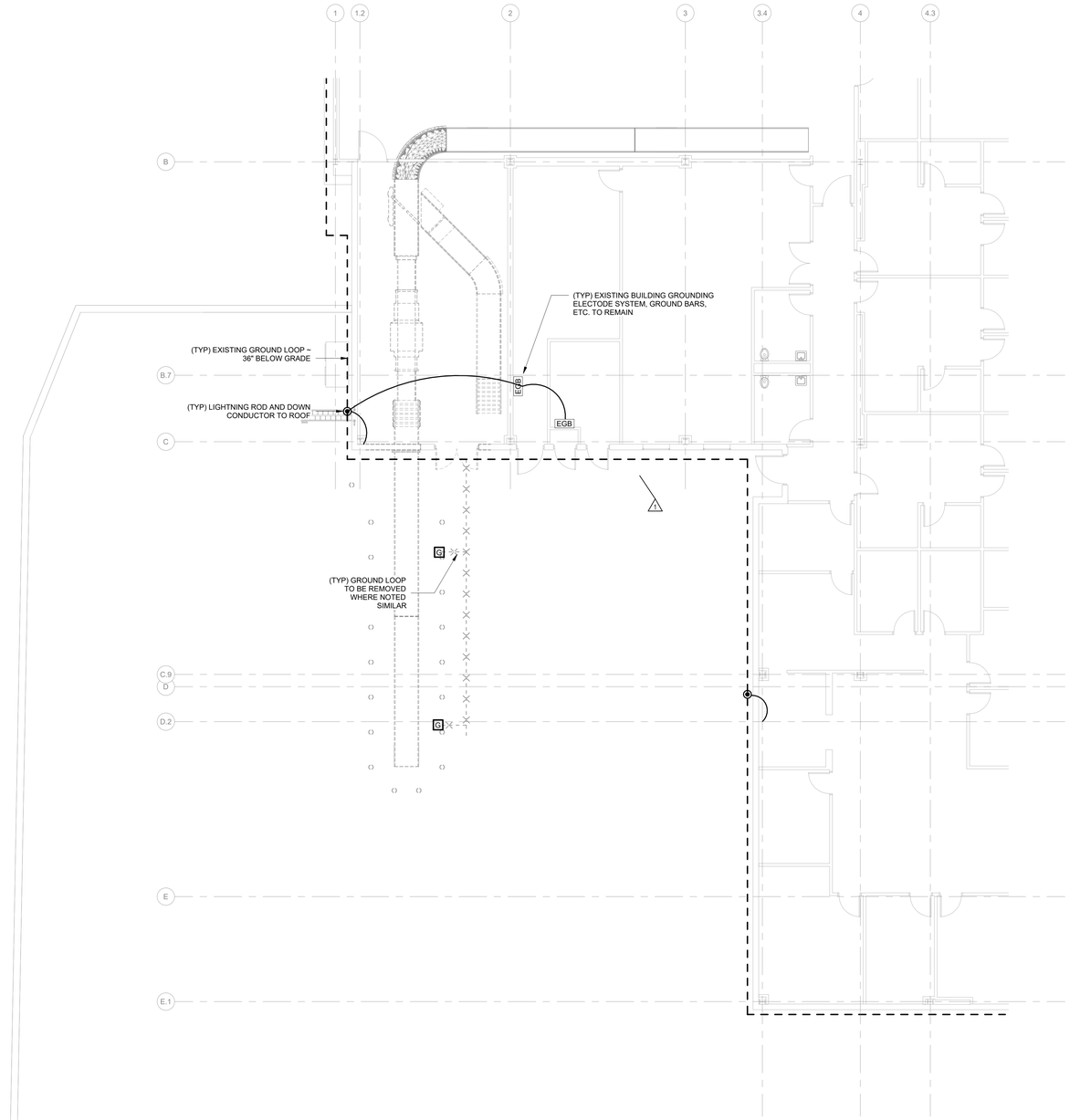
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FIRST FLOOR LIGHTING DEMOLITION PLAN

SHEET NO.:
ED121

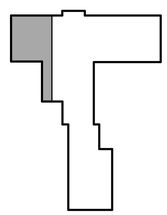
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GENERAL NOTES:

1. DRAWINGS ARE BASED ON AS-BUILT CONSTRUCTION DRAWINGS AND SITE INVESTIGATION. EXACT LOCATIONS ARE SUBJECT TO SITE CONDITIONS. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN FIELD



N 1 **FIRST FLOOR POWER DEMO PLAN**
1/8" = 1'-0"



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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
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SHEET CONTENTS
FIRST FLOOR GROUNDING DEMOLITION PLAN

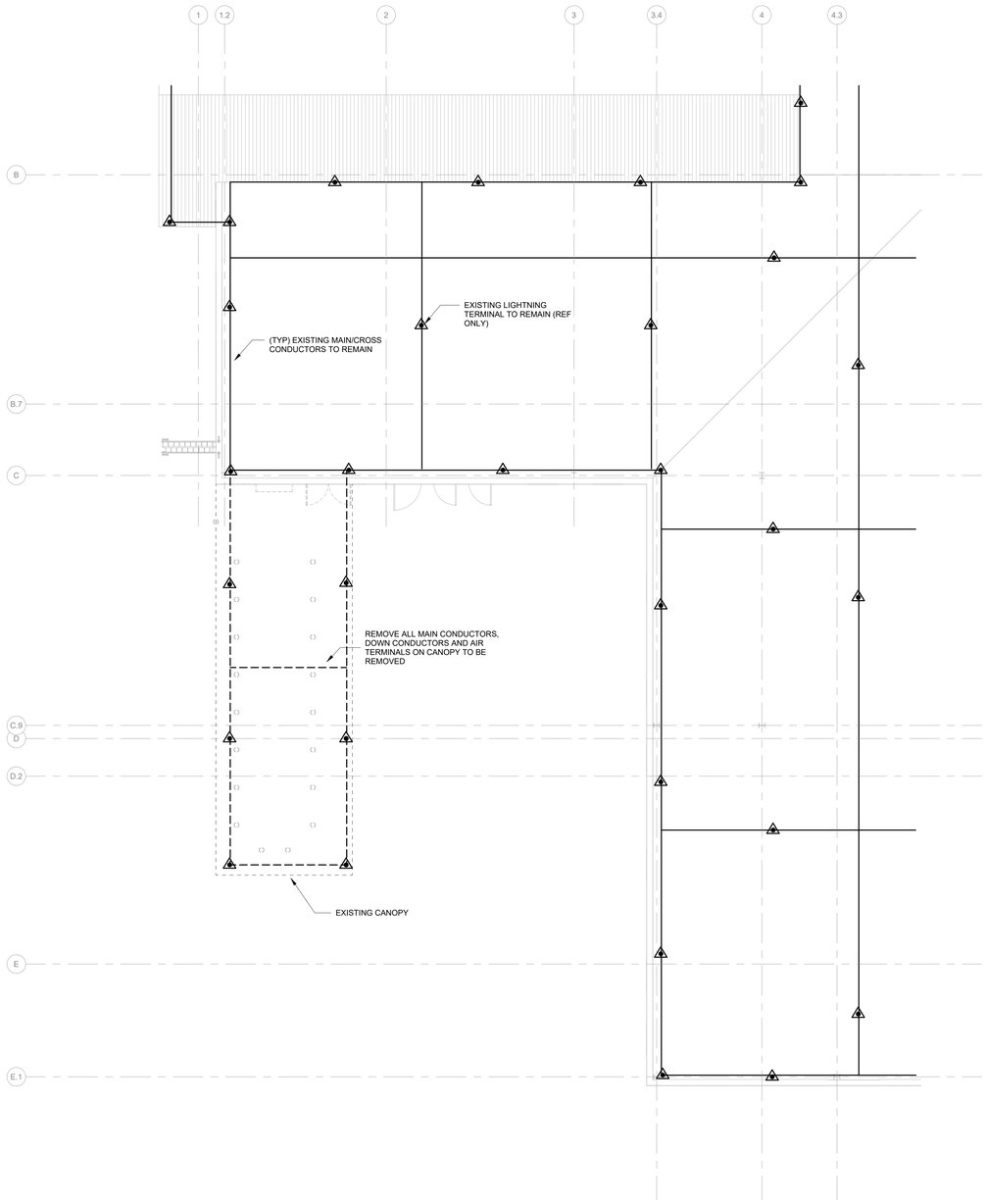
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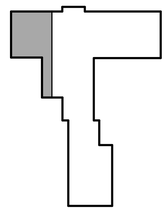
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GENERAL NOTES:

1. DRAWINGS ARE BASED ON AS-BUILT CONSTRUCTION DRAWINGS AND SITE INVESTIGATION. EXACT LOCATIONS ARE SUBJECT TO SITE CONDITIONS. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN FIELD



N 1 **PARTIAL ROOF GROUNDING/LPS DEMO**
1/8" = 1'-0"



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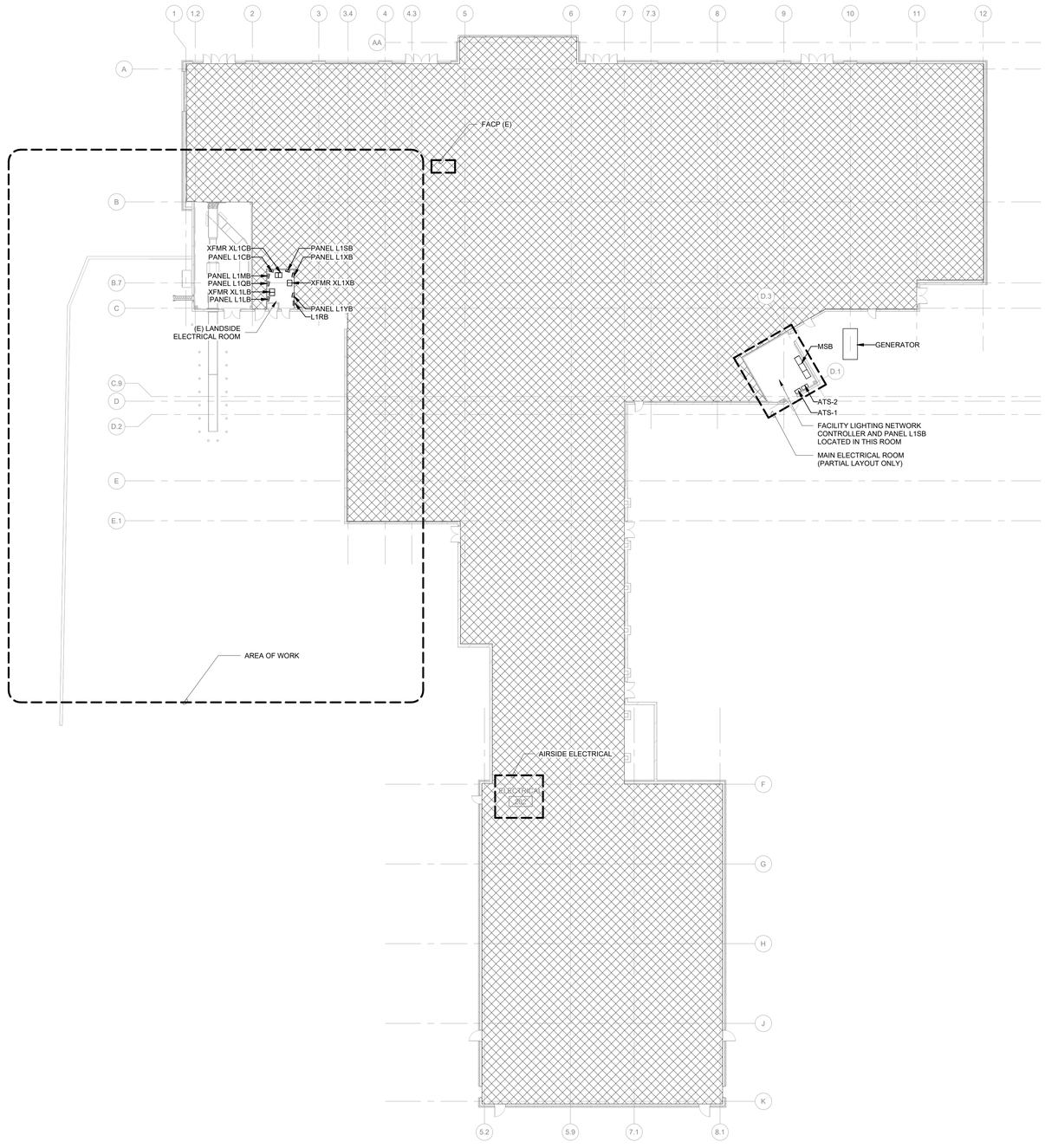
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ROOF GROUNDING/LPS DEMO PLAN

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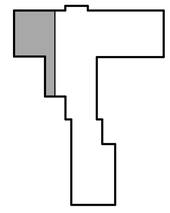
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GENERAL NOTES:

1. REFER TO SHEET E-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.
2. REFER TO E-500 SERIES SHEETS FOR DETAILS, E-600 SERIES SHEETS FOR SCHEDULES, AND E-701 FOR ONE-LINE DIAGRAMS.
3. ALL CONDUIT MOUNTING ACCESSORIES SHALL BE SECURED TO SPRUNG STRUCTURE WITH MANUFACTURER RECOMMENDED CLAMPS AND FITTINGS, SIZED TO ACCOMMODATE THE LOAD THEY ARE CARRYING
4. SEE SPECIFICATIONS FOR SIESMIC DESIGN BRACING DELIGATED DESIGN REQUIREMENTS



N 1 **FIRST FLOOR POWER PLAN**
1" = 20'-0"



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BAGGAGE SCREENING MODS.

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FIRST FLOOR
OVERALL PLAN

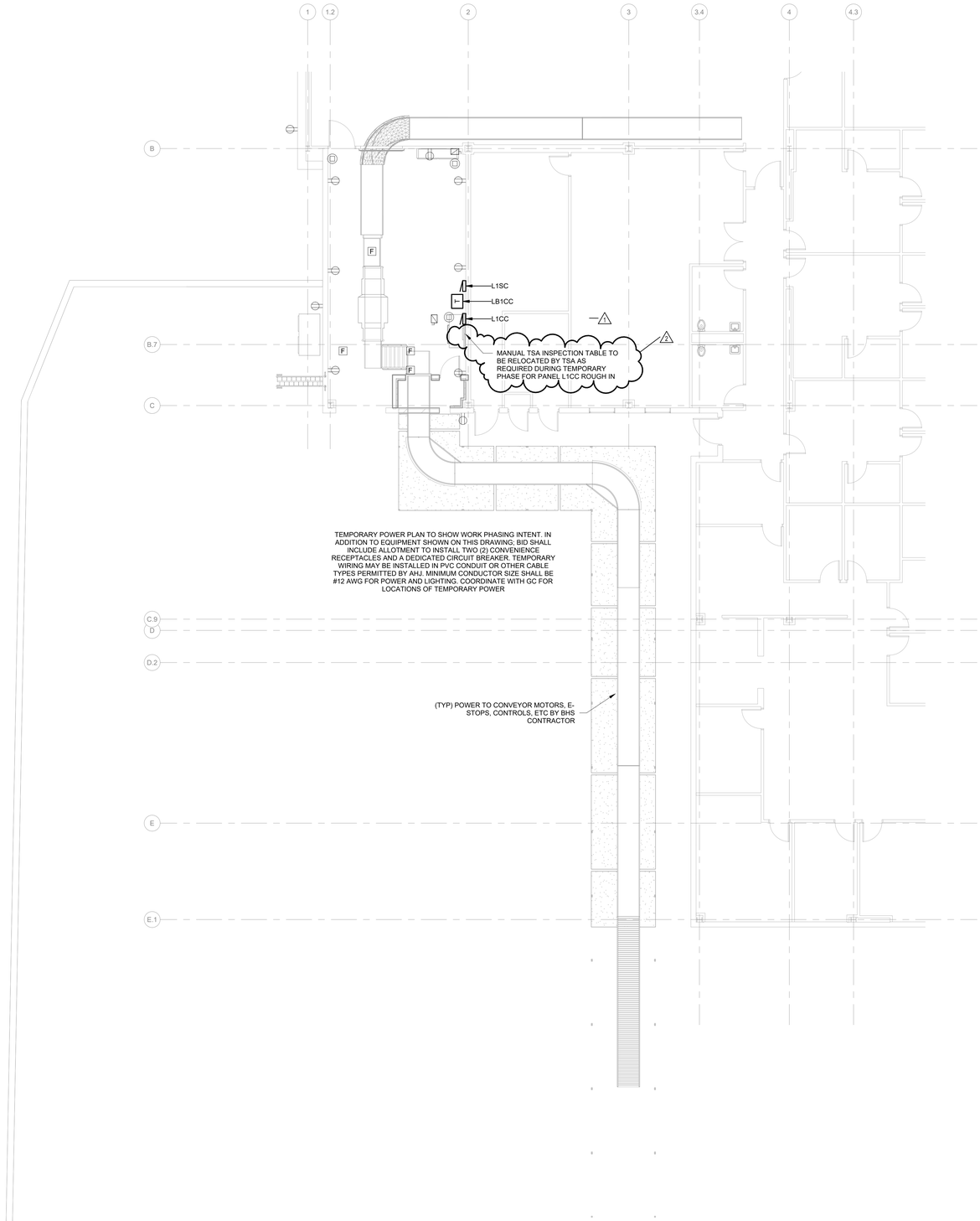
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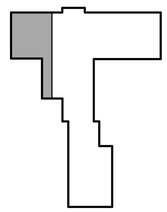
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4. SEE SPECIFICATIONS FOR SIESMIC DESIGN BRACING DELIGATED DESIGN REQUIREMENTS



TEMPORARY POWER PLAN TO SHOW WORK PHASING INTENT. IN ADDITION TO EQUIPMENT SHOWN ON THIS DRAWING; BID SHALL INCLUDE ALLOTMENT TO INSTALL TWO (2) CONVENIENCE RECEPTACLES AND A DEDICATED CIRCUIT BREAKER. TEMPORARY WIRING MAY BE INSTALLED IN PVC CONDUIT OR OTHER CABLE TYPES PERMITTED BY AHJ. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG FOR POWER AND LIGHTING. COORDINATE WITH GC FOR LOCATIONS OF TEMPORARY POWER

N 1 **PARTIAL FIRST FLOOR POWER PLAN TEMPORARY**
1/8" = 1'-0"



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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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FIRST FLOOR TEMPORARY POWER PLAN

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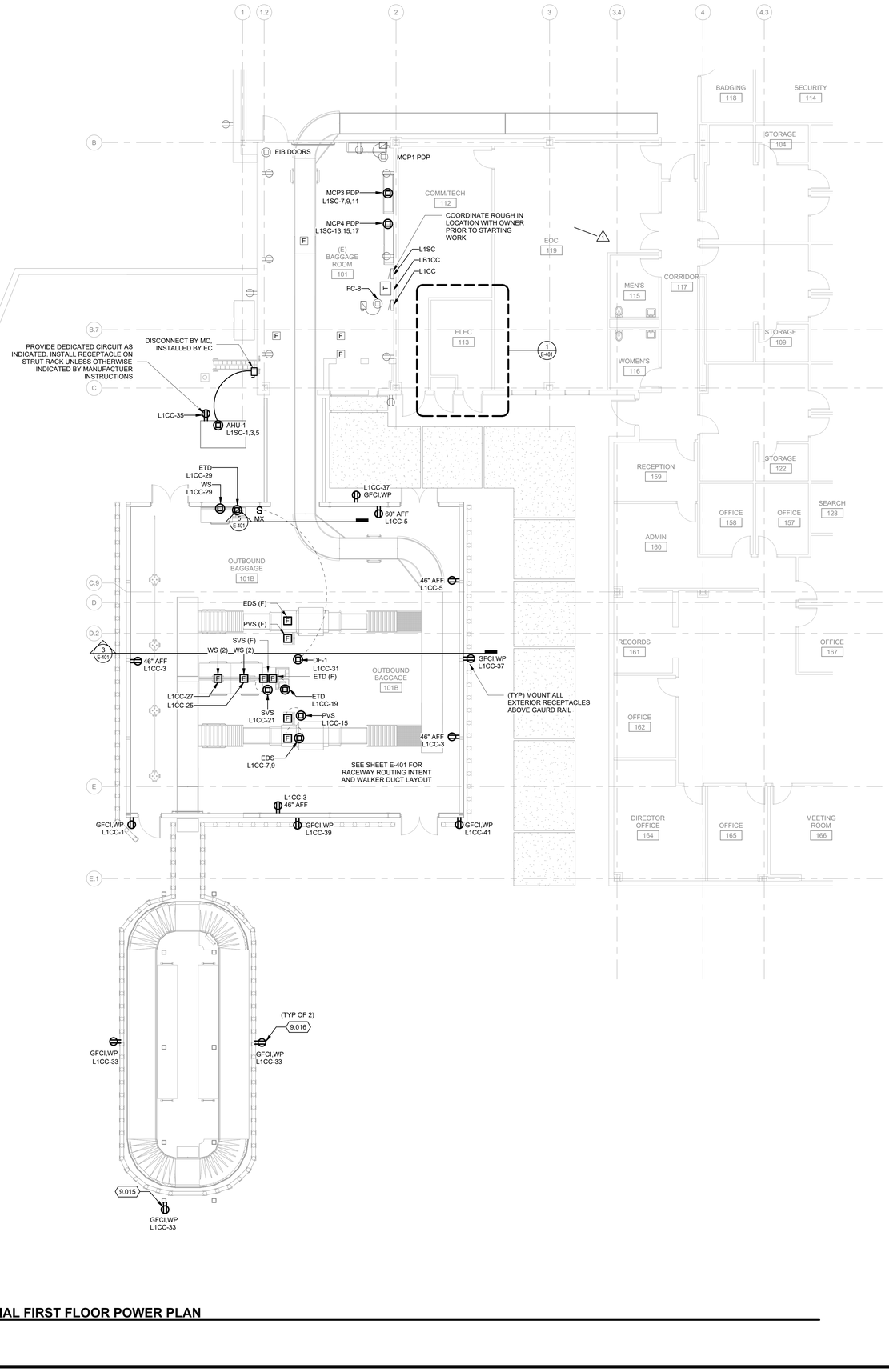
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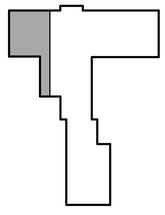
KEYED NOTES

9.015 MOUNT RECEPTACLE ON CANOPY COLUMN. PROVIDE WHILE-IN-USE STYLE COVER WITH WATER TIGHT FITTINGS. ROUTE RACEWAY UNDERGROUND, TRANSITION TO RMC WITHIN 3'-0" OF THE COLUMN, PROVIDE STRAP TYPE SUPPORT FOR BOX AND RACEWAY, DO NOT TAP OR DRILL COLUMN WITHOUT APPROVAL FROM STRUCTURAL ENGINEER.

9.016 MOUNT RECEPTACLE ON GUARD RAIL. COORDINATE LOCATION WITH BAGGAGE HANDLING CONTRACTOR, LOCATE RECEPTACLE BACKBOX WITH WHILE-IN-USE COVER ON THE INSIDE OF THE GUARDRAIL TO PROTECT FROM TUG COLLISION DAMAGE. ROUTE ALL CONDUITS ON INTERIOR SIDE OF GUARD RAIL. ALL EXTERIOR RACEWAYS SHALL BE RMC TYPE.



N 1 **PARTIAL FIRST FLOOR POWER PLAN**
1/8" = 1'-0"



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BAGGAGE SCREENING MODS.

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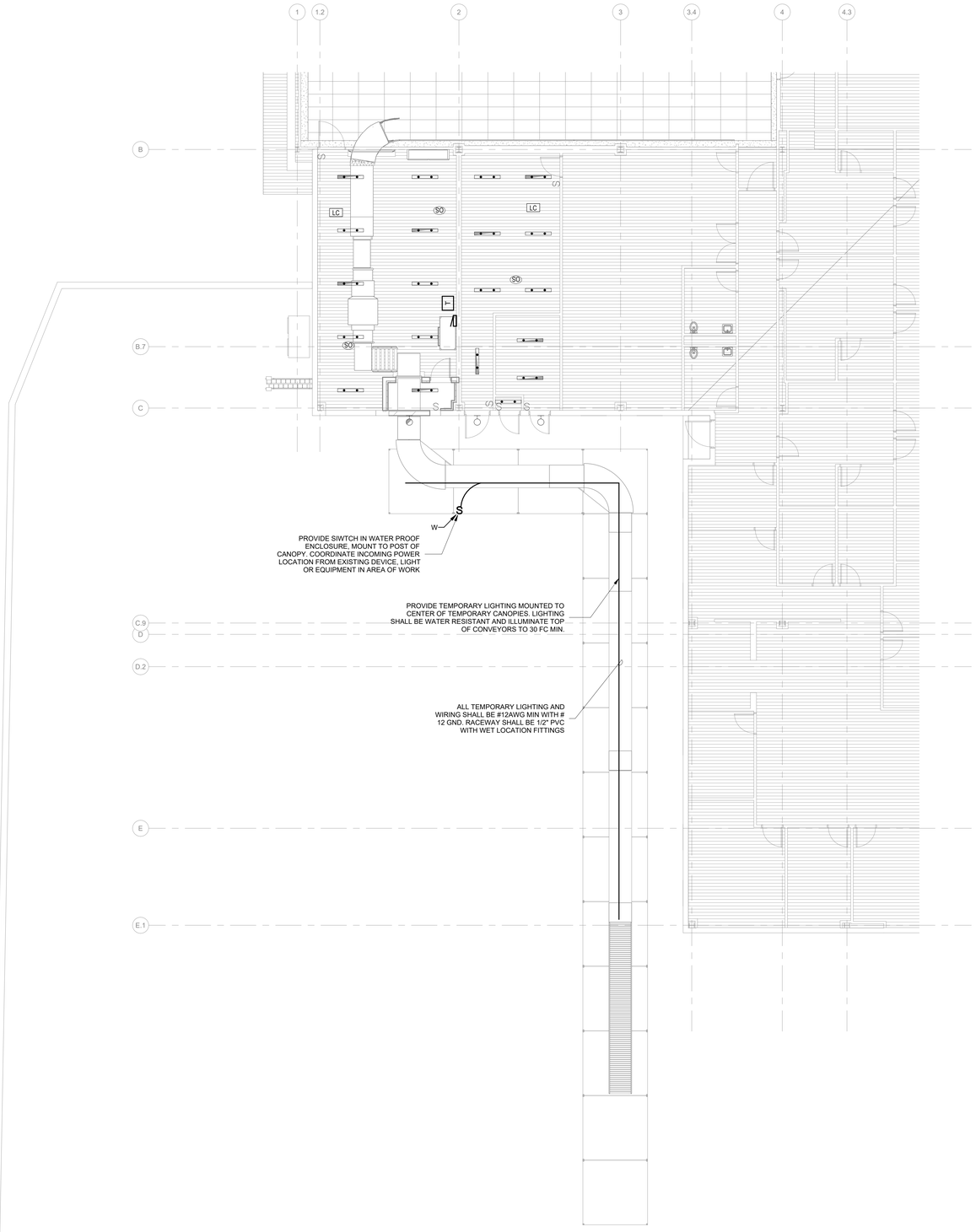
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FIRST FLOOR POWER PLAN

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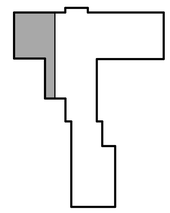
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GENERAL NOTES:

1. ALIGN DEVICES VERTICALLY WHERE LIGHTING, POWER AND OTHER DEVICES WITH DIFFERENT MOUNTING HEIGHTS ARE INDICATED CLOSE TO OTHER DEVICES.
2. LIGHT SWITCHES SHALL BE MOUNTED ON LATCH SIDE OF DOOR WITHIN 12" OF DOOR IN OPEN POSITION. COORDINATE LOCATION WITH OTHER WALL DEVICES PRIOR TO ROUGH-IN.
3. ALL CONDUIT MOUNTING ACCESSORIES SHALL BE SECURED TO SPRUNG STRUCTURE WITH MANUFACTURER RECOMMENDED CLAMPS AND FITTINGS, SIZED TO ACCOMMODATE THE LOAD THEY ARE CARRYING



N 1 **FIRST FLOOR LIGHTING PLAN**
1/8" = 1'-0"



KEY PLAN

Mead & Hunt

Mead & Hunt, Inc.
3110 E.Guasti Road,
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

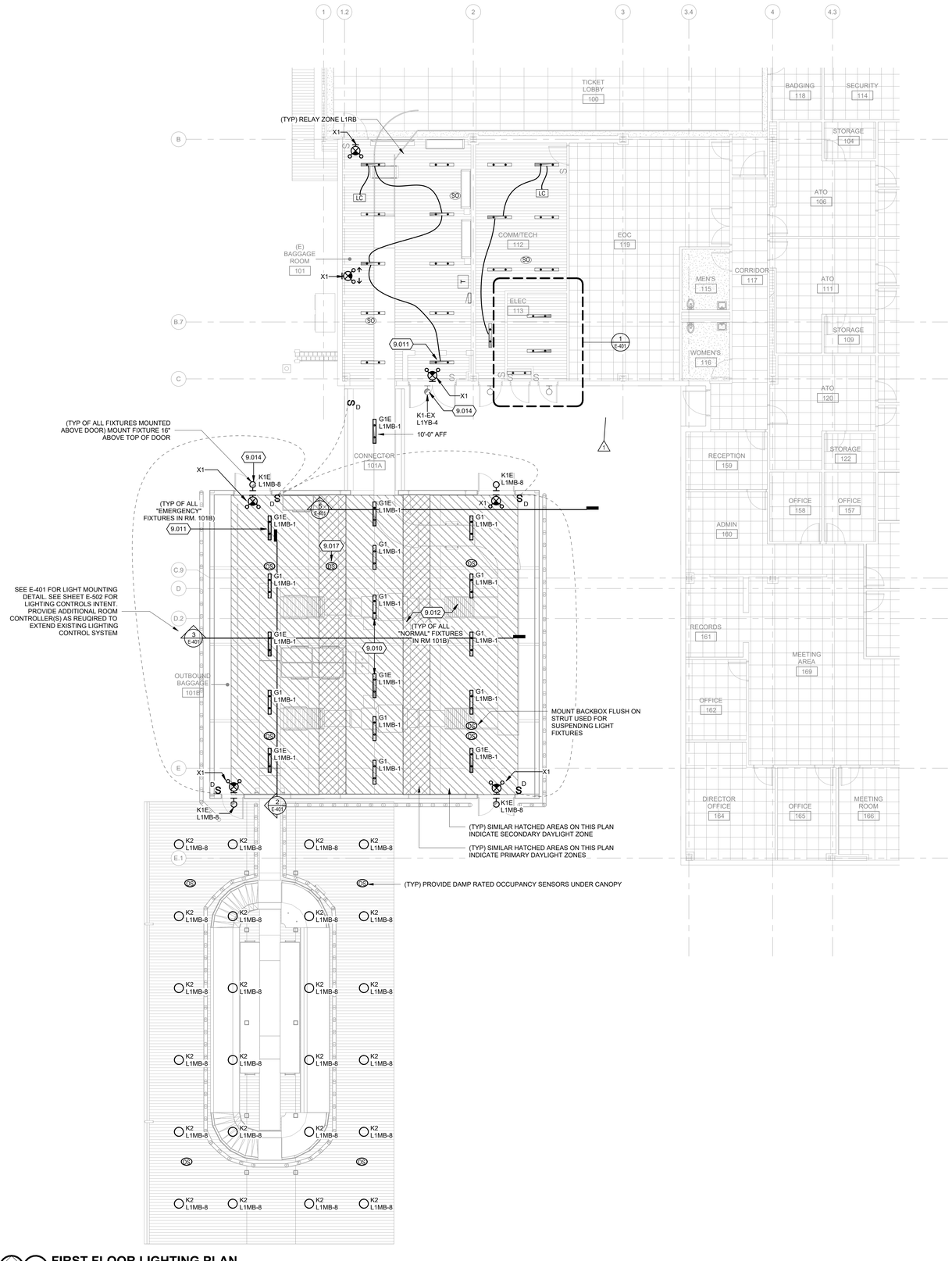
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DATE: September 30, 2025
DESIGNED BY: RJV
DRAWN BY: RJV
CHECKED BY: JRH
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SHEET CONTENTS
FIRST FLOOR TEMPORARY LIGHTING PLAN

SHEET NO.:
E-121

2/24/2026 3:47:29 PM C:\Revit Local\222814.02-E-R24_Richard.vojtisek.rvt



FIRST FLOOR LIGHTING PLAN

1/8" = 1'-0"

GENERAL NOTES:

1. EXTEND AN UNSWITCHED PORTION OF THE CIRCUIT SERVING THE AREA AND OR SPACE TO EBU(S) AND OR EMERGENCY BATTERY/BALLAST WHERE INDICATED, SO THAT UPON LOSS OF NORMAL POWER LUMINAIRE(S) OPERATES FROM EMERGENCY BATTERY.
2. MOUNT EBU(S) AT 8'-0" AFF UNLESS NOTED OTHERWISE.
3. COORDINATE EGRESS LIGHTING AND EXIT REQUIREMENTS WITH ARCHITECTURAL LIFE SAFETY PLANS.
4. ALL EXIT SIGNS TO BE WIRED TO EMERGENCY CIRCUIT SERVING THE AREA.
5. LOCATE ALL PT'S IN ELECTRICAL ROOM, ADJACENT TO PANEL SERVING LIGHTS, OR LOCATED ABOVE LIGHT SWITCHES (8'-0" MIN.) AND LABEL AS REQUIRED FOR IDENTIFICATION OF LIGHTS IN THE AREA THEY ARE LOCATED. LOCATION OF PT'S SHOWN ON PLANS ARE DIAGRAMMATIC AND DO NOT SUGGEST THE ACTUAL QUANTITY REQUIRED. (1) PT PER SWITCH/SENSOR CONTROLLED AREA REQUIRED.
6. ALIGN DEVICES VERTICALLY WHERE LIGHTING, POWER AND OTHER DEVICES WITH DIFFERENT MOUNTING HEIGHTS ARE INDICATED CLOSE TO OTHER DEVICES.
7. LIGHT SWITCHES SHALL BE MOUNTED ON LATCH SIDE OF DOOR WITHIN 12" OF DOOR IN OPEN POSITION. COORDINATE LOCATION WITH OTHER WALL DEVICES PRIOR TO ROUGH-IN.
8. ALL WALL-MOUNTED LUMINAIRE MOUNTING HEIGHTS SHOWN ON PLANS ARE MEASURED AFF TO BOTTOM OF LUMINAIRE, UNLESS NOTED OTHERWISE
9. ALL CONDUIT MOUNTING ACCESSORIES SHALL BE SECURED TO SPRUNG STRUCTURE WITH MANUFACTURER RECOMMENDED CLAMPS AND FITTINGS, SIZED TO ACCOMMODATE THE LOAD THEY ARE CARRYING
10. SEE SPECIFICATIONS FOR SIESMIC DESIGN BRACING DELIGATED DESIGN REQUIREMENTS

KEYED NOTES

9.010 COORDINATE FIXTURE LOCATION WITH DESTRATIFICATION FAN, DO NOT LOCATE LIGHTS DIRECTLY UNDER FAN

9.011 INTERCEPT EMERGENCY CIRCUIT FROM EXISTING PANEL L1YB-1 AND EXTEND TO NEW ADDITION. THIS CIRCUIT SHALL BE WIRED TO ALL FIXTURES IDENTIFIED AS "EMERGENCY", INCLUDING ALL EXIT SIGNS. FIELD LOCATE AND EXTEND UNSWITCHED HOT CONDUCTOR THAT BYPASSES RELAY FROM CIRCUIT PROVIDING NORMAL POWER TO FIXTURE (L1MB-1) AND WIRE TO FIXTURE POWER TRANSFER DEVICE

9.012 INTERCEPT NORMAL POWER CIRCUIT, L1MB-1, UPSTREAM ALL CONTROL DEVICES IN ROOM, MAINTAIN WIRING FROM RELAY IN L1RB. EXISTING RELAY TIME CLOCK CONTROLS SHALL BE EXTENDED TO AREA OF NEW WORK. EXTEND TO NEW ADDITION. UNLESS NOTED, ALL NORMAL POWER FOR LIGHT FIXTURES IN BAGGAGE HANDLING ADDITION SHALL BE POWERED FROM THIS CIRCUIT.

9.014 EXISTING EMERGENCY CIRCUIT L1YB-4 TO BE EXTENDED TO FIXTURES NOTED. MAINTAIN CONTROLS FUNCTIONALITY FROM EXISTING RELAY GROUP IN RELAY PANEL L1RB.

9.017 PENDANT MOUNT SENSOR FROM STRUCTURE ABOVE

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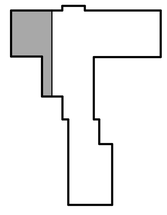
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED:
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1 09/30/25 PERMIT REVISION



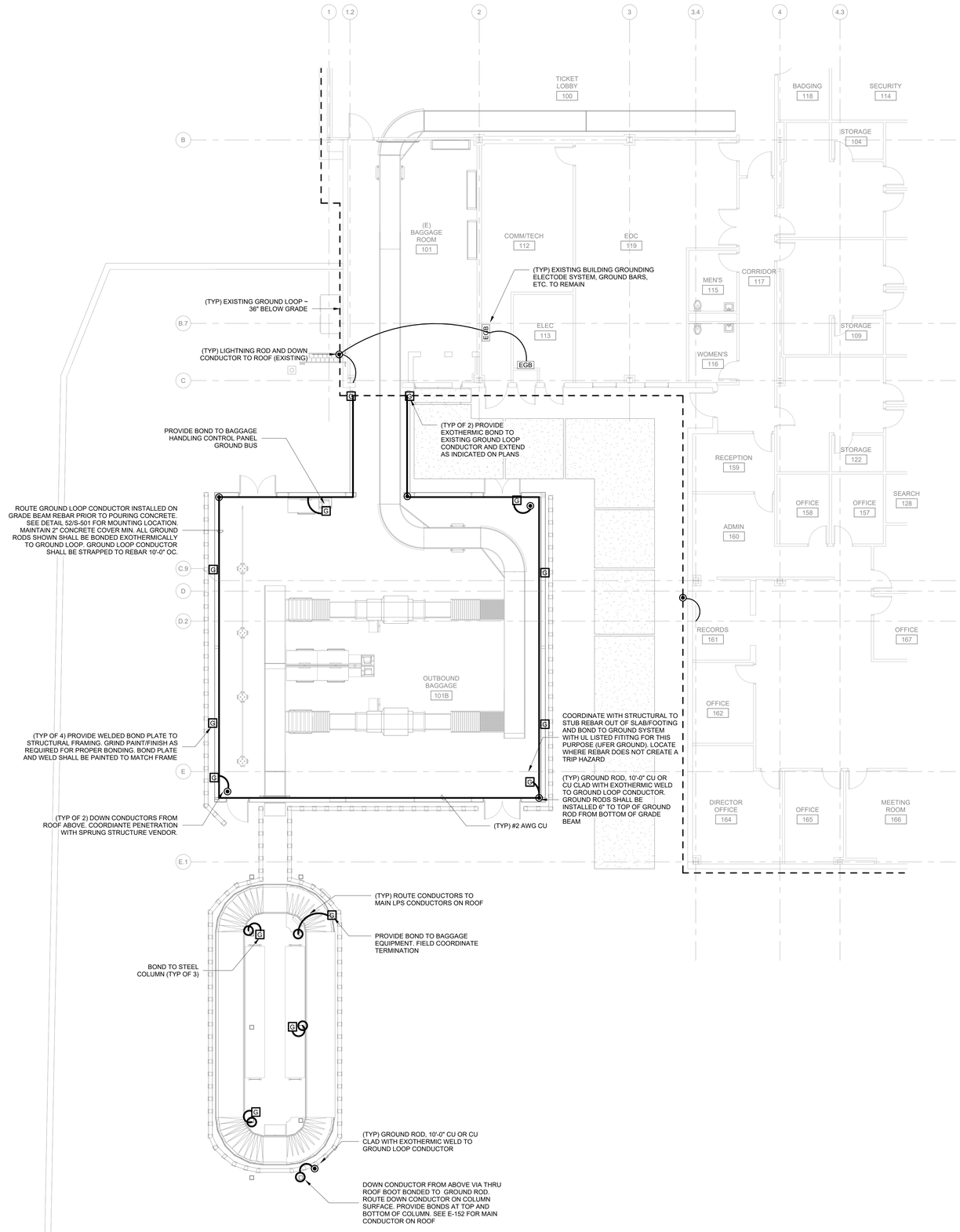
KEY PLAN

M&H NO.: 1943000-222814.02
DATE: September 30, 2025
DESIGNED BY: RJV
DRAWN BY: RJV
CHECKED BY: JRH
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SHEET CONTENTS
FIRST FLOOR LIGHTING PLAN

SHEET NO.:
E-122

2/24/2026 3:47:31 PM C:\Revit Local\222814.02-E-R24_Richard.vojtasek.rvt



N 1 **PARTIAL FIRST FLOOR GROUNDING PLAN**
1/8" = 1'-0"

GENERAL NOTES:

1. THE INTENT OF THE LIGHTNING PROTECTION SYSTEM (LPS) IS SHOWN ON THIS DRAWING. ELECTRICAL CONTRACTOR SHALL PROVIDE A DESIGN THAT MEETS THE REQUIREMENTS INDENTIFIED IN SPECIFICATION 264113.
2. THE LIGHTNING PROTECTION INSTALLATION SHALL COMPLY IN ALL RESPECTS TO LIGHTNING PROTECTION INSTITUTE STANDARD 175. THE INSTALLATION SHALL BE MADE BY OR UNDER THE SUPERVISION OF AN LPI CERTIFIED MASTER INSTALLER. THE COMPLETED INSTALLATION WILL RECEIVE SYSTEM CERTIFICATION SUBMITTAL FORM LPI 176.
3. THE LIGHTNING PROTECTION SYSTEM SHALL BE INSTALLED IN A NEAT AND INCONSPICUOUS MANNER SO THAT ALL COMPONENTS WILL BLEND IN WITH THE APPEARANCE OF THE BUILDING. ALL DOWN CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT CONCEALED FROM NORMAL VIEW FROM EXTERIOR LOCATIONS. EXPOSED CONDUIT AND/OR CONDUCTORS ON THE BUILDING EXTERIOR IS UNACCEPTABLE.
4. THE DESIGN LAYOUT AND INSTALLATION DETAILS SHALL MEET THE REQUIREMENTS OF UNDERWRITERS' LABORATORIES STANDARD 96A FOR MASTER LABELED LIGHTNING PROTECTION SYSTEMS. THE ACTUAL MASTER LABEL WILL BE DELIVERED UPON COMPLETION OF INSTALLATION.
5. THE DESIGN LAYOUT AND INSTALLATION DETAILS SHALL MEET THE REQUIREMENTS OF NFPA 780, CURRENT EDITION.
6. INDUCTIVE METAL BODIES LOCATED ABOUT THE ROOF SUCH AS: METAL FLASHING, GRAVEL STOPS, ROOF DRAINS, SOIL PIPE VENTS, INSULATION VENTS, LOUVERS AND DOOR FRAMES SITUATED WITHIN (6'-0") OF A LIGHTNING CONDUCTOR OR BONDED METAL BODY SHALL BE INTERCONNECTED TO THE LIGHTNING CONDUCTOR SYSTEM.
7. NO BEND OF A CONDUCTOR SHALL FORM A FINAL INCLUDED ANGLE OF LESS THAN 90 DEGREES NOR SHALL BEND RADIUS OF LESS THAN (8").
8. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE FASTENED NOT MORE THAN (3'-0") MAXIMUM SPACING.
9. FOR SAKE OF CLARITY NOT ALL COMPONENTS ARE SHOWN ON THE PLAN. FOR ADDITIONAL INFORMATION REFER TO SPECIFICATIONS AND SEE DETAILS.
10. NO PART OF THE FACILITY STRUCTURE SHALL BE USED AS A DOWN CONDUCTOR NOR ANY PORTION OF THE STRUCTURE USED AS A CONDUCTOR, EXCEPT AS NECESSARY TO PROTECT THE STRUCTURE ITSELF.
11. INSTALLATION OF THE LIGHTNING PROTECTION SYSTEM SHALL NOT VOID THE WARRANTY OF THE ROOF.

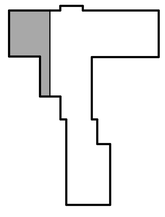
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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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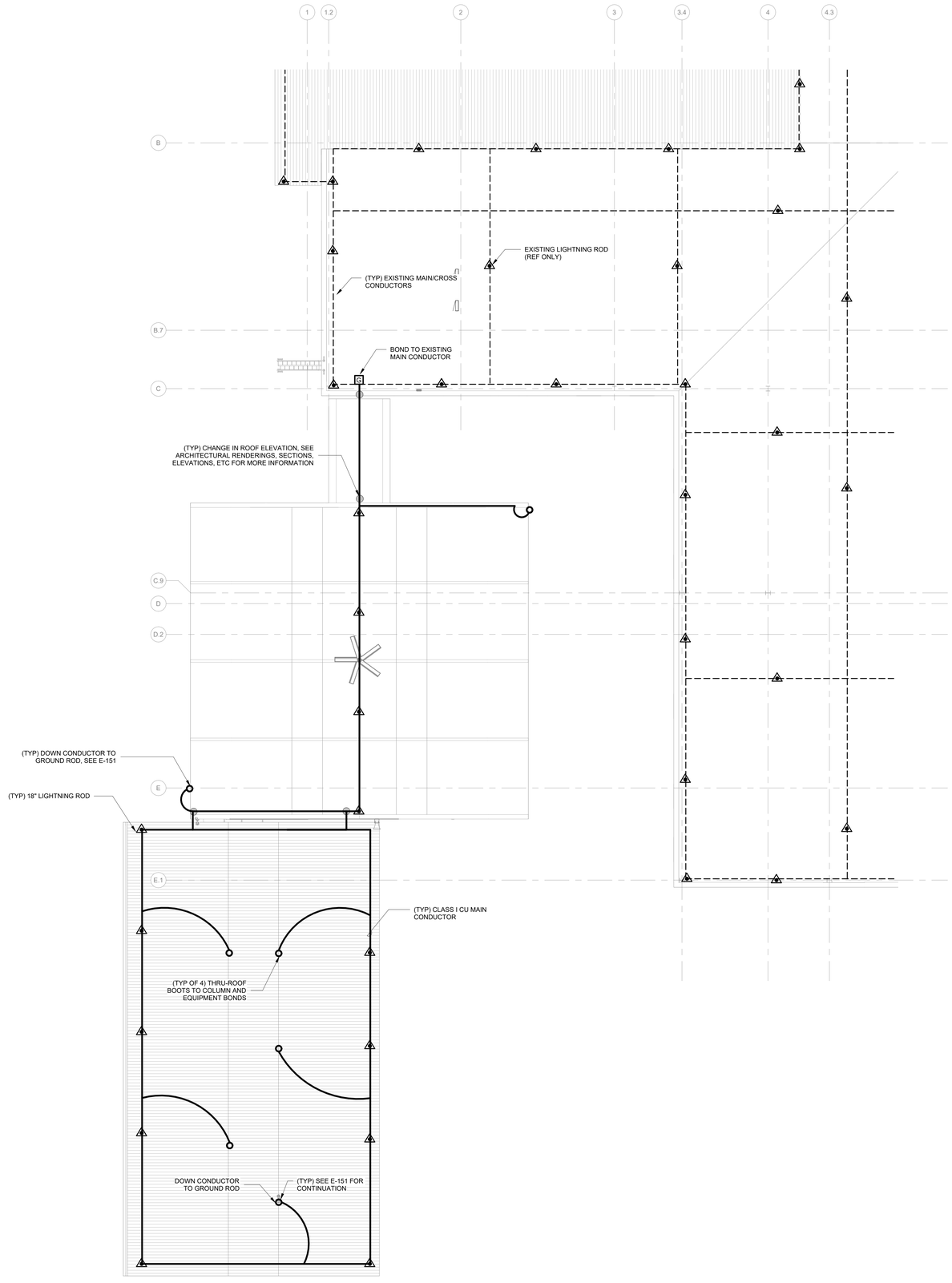
KEY PLAN

M&H NO.: 1943000-222814.02
DATE: September 30, 2025
DESIGNED BY: RJV
DRAWN BY: RJV
CHECKED BY: JRH
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SHEET CONTENTS
FIRST FLOOR GROUNDING PLAN

SHEET NO.:
E-151

2/24/2026 3:47:33 PM C:\Revit Local\222814.02-E-R24_Richard.vojtasek.rvt



N 1 **PARTIAL ROOF GROUNDING/LPS PLAN**
1/8" = 1'-0"

GENERAL NOTES:

1. THE INTENT OF THE LIGHTNING PROTECTION SYSTEM (LPS) IS SHOWN ON THIS DRAWING. ELECTRICAL CONTRACTOR SHALL PROVIDE A DESIGN THAT MEETS THE REQUIREMENTS INDENTIFIED IN SPECIFICATION 264113.
2. THE LIGHTNING PROTECTION INSTALLATION SHALL COMPLY IN ALL RESPECTS TO LIGHTNING PROTECTION INSTITUTE STANDARD 175. THE INSTALLATION SHALL BE MADE BY OR UNDER THE SUPERVISION OF AN LPI CERTIFIED MASTER INSTALLER. THE COMPLETED INSTALLATION WILL RECEIVE SYSTEM CERTIFICATION SUBMITTAL FORM LPI 176.
3. THE LIGHTNING PROTECTION SYSTEM SHALL BE INSTALLED IN A NEAT AND INCONSPICUOUS MANNER SO THAT ALL COMPONENTS WILL BLEND IN WITH THE APPEARANCE OF THE BUILDING. ALL DOWN CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT CONCEALED FROM NORMAL VIEW FROM EXTERIOR LOCATIONS. EXPOSED CONDUIT AND/OR CONDUCTORS ON THE BUILDING EXTERIOR IS UNACCEPTABLE.
4. THE DESIGN LAYOUT AND INSTALLATION DETAILS SHALL MEET THE REQUIREMENTS OF UNDERWRITERS' LABORATORIES STANDARD 96A FOR MASTER LABELED LIGHTNING PROTECTION SYSTEMS. THE ACTUAL MASTER LABEL WILL BE DELIVERED UPON COMPLETION OF INSTALLATION.
5. THE DESIGN LAYOUT AND INSTALLATION DETAILS SHALL MEET THE REQUIREMENTS OF NFPA 780, CURRENT EDITION.
6. INDUCTIVE METAL BODIES LOCATED ABOUT THE ROOF SUCH AS: METAL FLASHING, GRAVEL STOPS, ROOF DRAINS, SOIL PIPE VENTS, INSULATION VENTS, LOUVERS AND DOOR FRAMES SITUATED WITHIN (6'-0") OF A LIGHTNING CONDUCTOR OR BONDED METAL BODY SHALL BE INTERCONNECTED TO THE LIGHTNING CONDUCTOR SYSTEM.
7. NO BEND OF A CONDUCTOR SHALL FORM A FINAL INCLUDED ANGLE OF LESS THAN 90 DEGREES NOR SHALL BEND RADIUS OF LESS THAN (8").
8. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE FASTENED NOT MORE THAN (3'-0") MAXIMUM SPACING.
9. FOR SAKE OF CLARITY NOT ALL COMPONENTS ARE SHOWN ON THE PLAN. FOR ADDITIONAL INFORMATION REFER TO SPECIFICATIONS AND SEE DETAILS.
10. NO PART OF THE FACILITY STRUCTURE SHALL BE USED AS A DOWN CONDUCTOR NOR ANY PORTION OF THE STRUCTURE USED AS A CONDUCTOR, EXCEPT AS NECESSARY TO PROTECT THE STRUCTURE ITSELF.
11. INSTALLATION OF THE LIGHTNING PROTECTION SYSTEM SHALL NOT VOID THE WARRANTY OF THE ROOF.

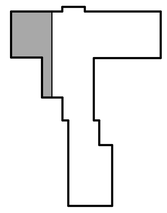
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BAGGAGE SCREENING MODS.

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SHEET CONTENTS
ROOF GROUNDING/LPS PLAN

SHEET NO.:
E-152

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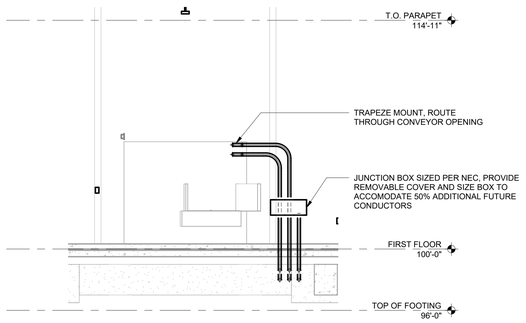
KEYED NOTES

9.006 UNDER FLOOR RACEWAY SYSTEM, BASIS OF DESIGN LEGRAND WALKERDUCT SERIES. PROVIDE NO. 2 DUCT, 3.34 SQ IN. MIN., FOR LOW VOLTAGE (WIRING BY OTHERS) AND NO. 4 DUCT, 8.72 SQ IN. MIN., FOR POWER WIRING, ALIGNMENT CLIP FOR SPACING, END CAPS AND JUNCTION BOXES AS RECOMMENDED BY MANUFACTURER INSTRUCTIONS. COORDINATE INSTALL WITH STRUCTURAL CONTRACTOR, INSTALL AND LEVEL AS REQUIRED. SECURE LEGS TO REBAR OR INTO COMPACTED EARTH TO PREVENT MOVEMENT DURING CONCRETE POUR

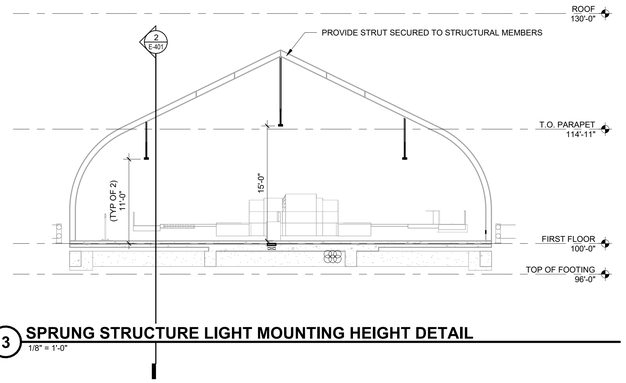
9.007 PROVIDE MANUFACTURERS RECOMMENDED CONDUIT ENTRANCE FITTING OR JUNCTION BOX TO ACCOMMODATE RACEWAYS INDICATED. ALL UNDERGROUND RACEWAYS SHALL BE SCHEDULE 80 PVC.

9.008 (TYP) ALL FLOOR BOXES SHOWN SHALL CONSIST OF A SHARED, DIVIDED FLOOR BOX OR TWO SEPARATE FLOOR BOXES TAPPED INTO BOTH LOW VOLTAGE UNDERGROUND DUCT AND LINE VOLTAGE UNDERGROUND DUCT. PROVIDE JUNCTION BOX SIZES AS REQUIRED FOR DEVICE(S) INDICATED ON EQUIPMENT SCHEDULE. FLOOR BOX TAPPED INTO LOW VOLTAGE UNDERGROUND DUCT SHALL BE PROVIDED WITH A BLANK COVER AND LARGE ENOUGH TO ACCOMMODATE FOUR (4) DEVICES. ALL FLOOR BOXES SHALL BE FLUSH ACTIVATION TYPE.

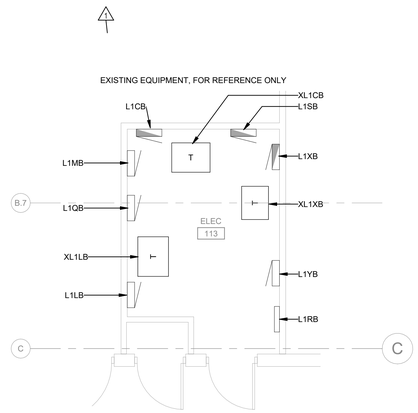
9.009 NO. 4 UNDERFLOOR DUCT WITH NO PRESETS MAY BE PROVIDED IN LIEU UNDERGROUND RACEWAYS



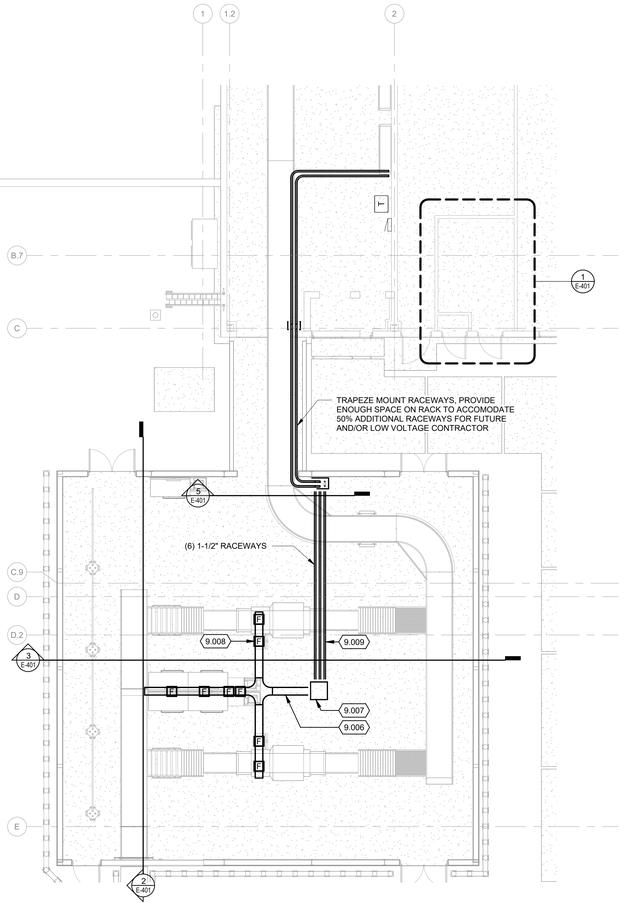
N 5 **RACEWAY ROUTING SECTION AND J-BOX LOCATION**
1/4" = 1'-0"



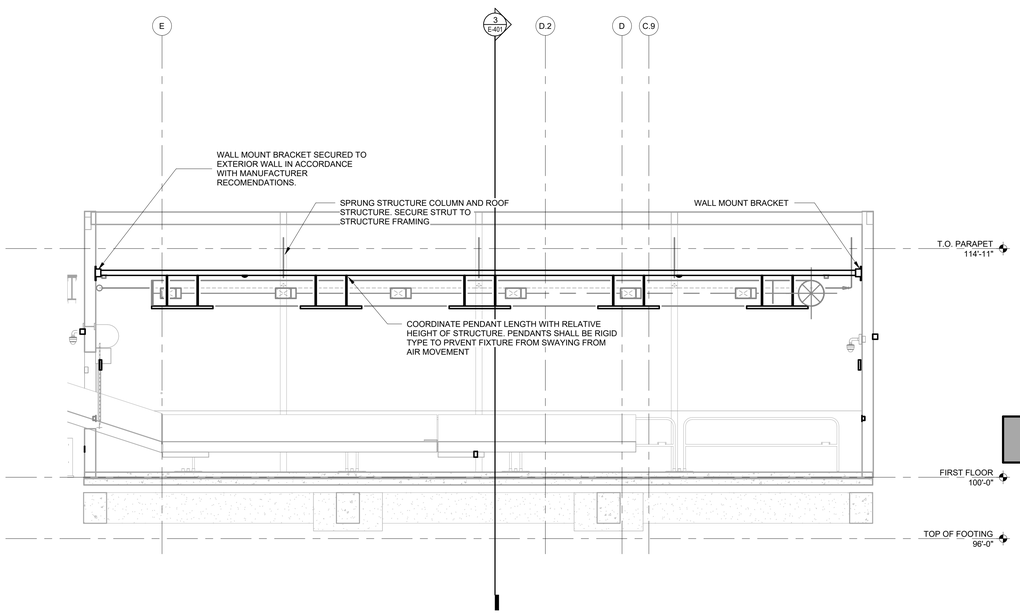
N 3 **SPRUNG STRUCTURE LIGHT MOUNTING HEIGHT DETAIL**
1/8" = 1'-0"



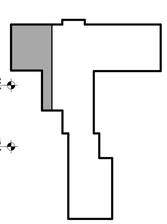
N 1 **ENLARGED ELECTRICAL ROOM (EXISTING)**
1/4" = 1'-0"



N 4 **PARTIAL FIRST FLOOR CONDUIT AND UNDERGROUND PLAN**
1/8" = 1'-0"



N 2 **SPRUNG STRUCTURE LIGHT MOUNTING DETAIL**
1/4" = 1'-0"



KEY PLAN

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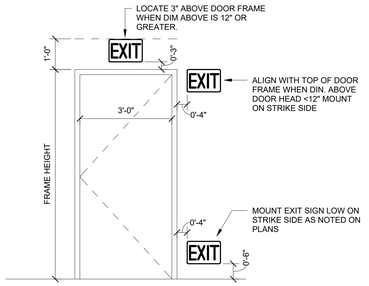
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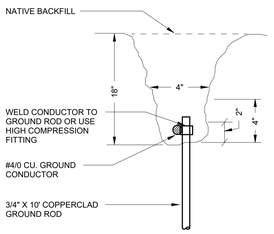
SHEET CONTENTS
ENLARGED PLANS, ELEVATIONS & SECTIONS

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E-401

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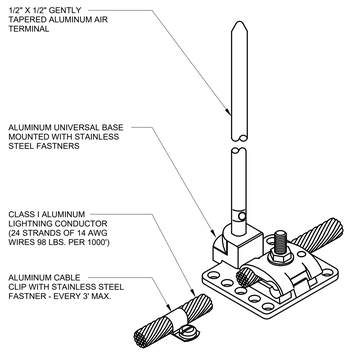
12 EXIT SIGN WALL MOUNTING AT DOOR
NO SCALE



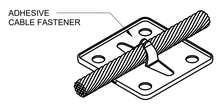
GENERAL NOTES:

1. NEUTRAL SYSTEM TO TEST AT LESS THAN 10 OHMS. IF THIS CAN'T BE MET, INFORM CONTRACTING OFFICER FOR DIRECTIONS.

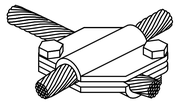
13 GROUND CONDUCTOR SECTION DETAIL
NO SCALE



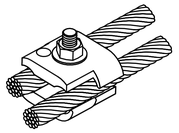
8 AIR TERMINAL BASE
NO SCALE



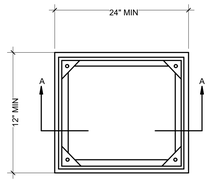
9 CABLE FASTENER
NO SCALE



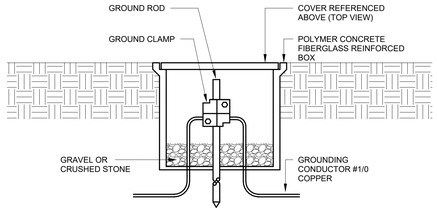
10 CROSS RUN CONNECTOR
NO SCALE



11 PARALLEL CONNECTOR
NO SCALE

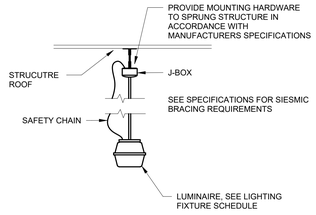


TOP VIEW (COVER REMOVED)

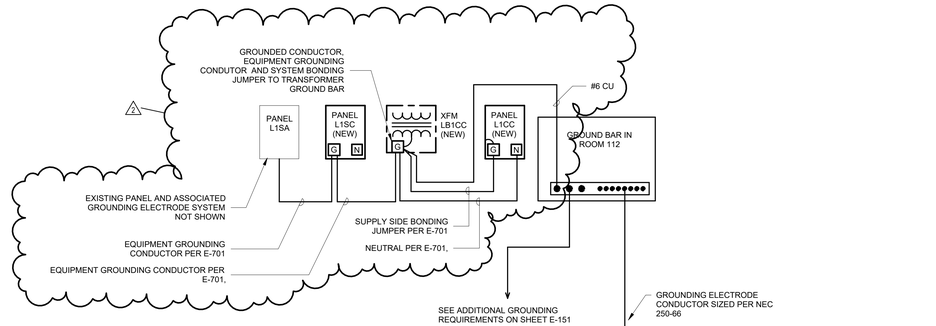


SECTION A - A

5 GROUND ACCESS WELL - DETAIL
NO SCALE



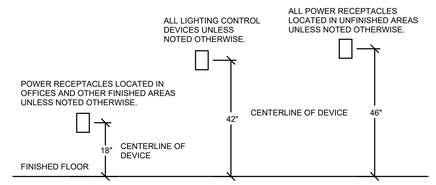
6 PENDANT FIXTURE MOUNTING
NO SCALE



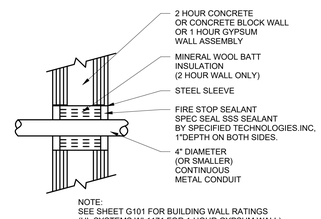
NOTES:
(A) THE METAL FRAME OF THE BUILDING SHALL BE BONDED TO THE #6 REBAR STUBBED THROUGH THE FLOOR FOUNDATION. SIZE BONDING JUMPER PER NEC 250-66.

7 GROUNDING ELECTRODE SYSTEM (TYP)
NO SCALE

NOTE:
MOUNTING HEIGHT DIMENSION FOR POWER RECEPTACLES ABOVE COUNTER SHALL BE 6" ABOVE TOP OF COUNTER OR COUNTER BACKSPLASH MEASURED TO THE CENTERLINE OF DEVICE.

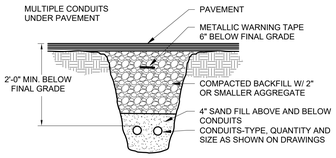


1 DEVICE MOUNTING HEIGHTS DETAIL
NO SCALE

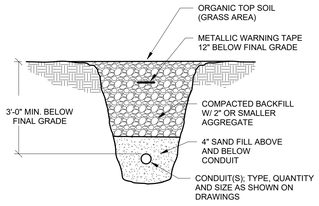


NOTE:
SEE SHEET G101 FOR BUILDING WALL RATINGS
(UL SYSTEMS WL1171 FOR 1-HOUR GYPSUM WALL)
(UL SYSTEMS WJ1070 FOR 2-HOUR CONCRETE WALL)

2 FIRESTOP WALL PENETRATION
NO SCALE



3 UNDERGROUND CONDUIT DETAIL-PAVEMENT
NO SCALE



4 UNDERGROUND CONDUIT
NO SCALE

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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

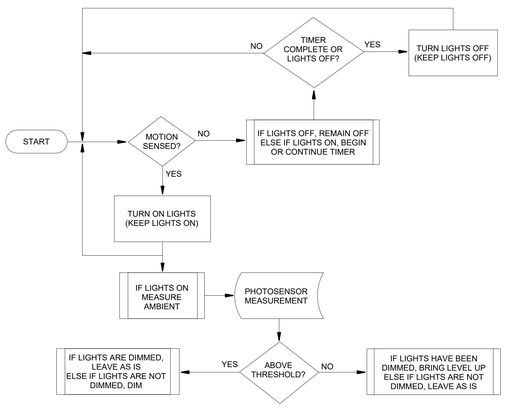
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09/03/25 ISSUED FOR PERMIT
1 09/30/25 PERMIT REVISION
2 01/28/26 PERMIT REVISION

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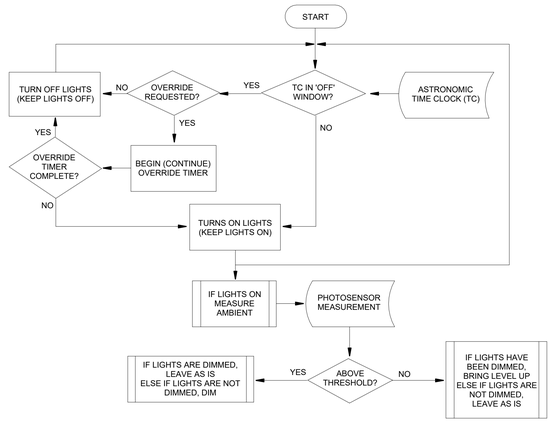
SHEET CONTENTS
DETAILS

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E-501

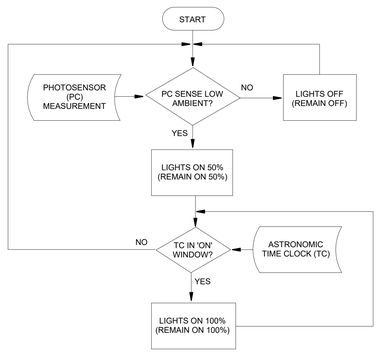
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OCCUPANCY SENSOR AND PHOTOSENSOR



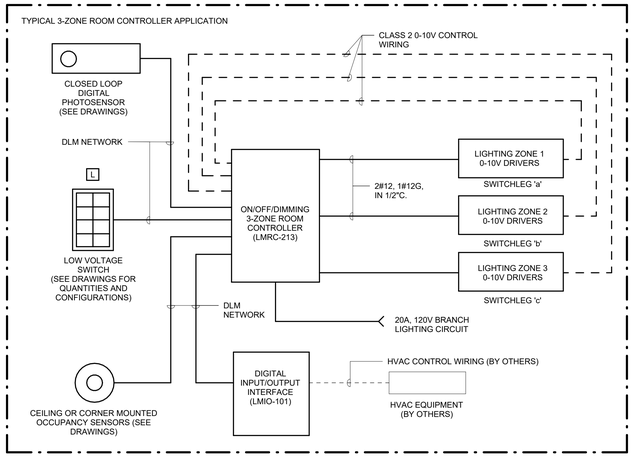
TIME CLOCK AND PHOTOSENSOR



TIME CLOCK AND PHOTOSENSOR
(BUILDING FACADE)

GENERAL NOTES

1. CONTROLS FLOW DIAGRAMS ARE BASED ON RECORD DRAWING INFORMATION. ANY DISCREPANCY BETWEEN THESE DIAGRAMS AND THE CURRENT CONTROLLER PROGRAMMING SHALL BE PROGRAMMED TO MATCH EXISTING OPERATION. INCLUDING TIMECLOCK SCHEDULE AND EXISTING PHOTO SENSORS.
2. EXISTING LIGHTING CONTROL SYSTEM SHALL BE EXTENDED. CONTACT FACILITY LIGHTING CONTROL SYSTEM INTEGRATOR WITH LEGRAND, JOE FULTON AT JOE.FULTON@LEGRAND.COM TO PROVIDE PROGRAMMING AND COMMISSIONING ON EXTENDED/ADDED CONTROLS. BID SHALL INCLUDE FEE TO REIMBURSE LEGRAND AT THE CONTRACTORS EXPENSE.
3. EXISTING LIGHTING CONTROL SYSTEM INCLUDES LEGRAND DLM N4 JACE NETWORK CONTROLLER, MODEL LMJA-8125 LOCATED IN MAIN ELECTRICAL ROOM. THE RELAY PANEL LOCATED IN THE LANDSIDE ELECTRICAL ROOM IS ASSUMED TO HAVE CAPACITY FOR THE ADDITION. ALL FIXTURES, CONTROL DEVICES, SWITCHES, ETC. SHALL BE COMPATIBLE WITH THE WATTSTOPPER EXISTING SYSTEM
4. PROVIDE NETWORKING BRIDGES, ROOM CONTROLLERS, DEVICES AND WIRING AS REQUIRED TO EXTEND EXISTING SYSTEM AND FUNCTIONALITY.
5. DIAGRAMS ATTEMPT TO SHOW OVERALL SYSTEM FUNCTIONALITY, EC SHALL DETERMINE AND LOCATE ADDITIONAL COMPONENTS AS NECESSARY.
6. DAYLIGHTING PRIMARY ZONES, DAYLIGHTING SECONDARY ZONES AND NON-DAYLIGHTING ZONES SHALL BE DIMMED SEPARATELY
7. SEE SHEET E-100 FOR LOCATIONS OF LIGHTING CONTROL PANELS AND NETWORK CONTROLLER



DETAIL NOTES:
1. ROOM CONTROLLER BASIS OF DESIGN IS WATTSTOPPER.
2. ROOM CONTROLLER MOUNTS TO 4" X 4" X 2-1/8" DEEP ELECTRICAL BOX. PROVIDE ADDITIONAL EXTENSION BOX IF REQUIRED.
3. IF 0-10V CONTROL WIRING WILL BE INSTALLED IN THE SAME RACEWAY AND/OR BOXES WITH 120V POWER WIRING, IT SHALL BE RECLASSIFIED AS CLASS 1 WIRING PER REQUIREMENTS OF NEC 725.49 AND SHALL BE LABELED ACCORDINGLY.

TIME CLOCK, OCCUPANCY SENSOR, PHOTOSENSOR
(CANOPY LIGHTING)

1 LIGHTING CONTROLS INTENT
NO SCALE

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SHEET CONTENTS
DETAILS

SHEET NO.:
E-502

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ELECTRICAL EQUIPMENT WIRING SCHEDULE

STARTER/TYPE:	DISCONNECT TYPE	ACCESSORIES (ACC):		
MS - MANUAL MOTOR STARTER (W/OVERLOAD RELAYS)	F-FUSED	SA-STANDARD ACCESSORIES (INCLUDES **ITEMS)		PF-PHASE FAILURE RELAY
MX - MANUAL MOTOR SWITCH	N- NON-FUSED	**AUX--TWO CONVERTIBLE AUXILIARY CONTACTS		TO-THERMAL OVERLOAD RELAYS
S - ENCLOSED FULL VOLTAGE MAGNETIC CONTROLLER	FS-BUSS FUSESTAT-TYPE SSY	**CT-CONTROL TRANSFORMER FUSED 120V		FA-4-CONVERTIBLE AUXILIARY CONTACTS
CS - COMBINATION FULL VOLTAGE MAGNETIC CONTROLLER	CB-ENCLOSED CIRCUIT BREAKER	**EO-ELECTRONIC OVERLOADS (SOLID-STATE)		GFP-CLASS II GROUND FAULT PROTECTION
RE - ENCLOSED REDUCED-VOLTAGE CONTROLLER	EFD-ELEVATOR FUSED DISCONNECT(SEE SPECIFICATION)	**HA-HAND-OFF-AUTO SWITCH IN DOOR		DC-DIGITAL COMMUNICATION MODULE
RE - COMBINATION REDUCED-VOLTAGE CONTROLLER		**PL-PILOT LIGHT(RED) IN DOOR		TS- 2-SPEED SELECTOR SWITCH IN DOOR
TW - MULTI 2 SPEED, 2 WINDING				EI-ELECTRICAL INTERLOCK (2) N.O. & (2) N.C
SW - MULTI 2 SPEED, 1 WINDING				SS-START-STOP PUSHBUTTON IN DOOR
VFD - VARIABLE FREQUENCY DRIVE				SN-SOLID NEUTRAL
SS - REDUCED VOLTAGE, SOLID STATE (SOFT START)				ST- SHUNT TRIP
RV - REDUCED VOLTAGE(AUTOXFMR)				GP- GREEN (OFF) PILOT LIGHT IN DOOR
YD - WYE-DELTA				ISG- ISOLATED GROUND KIT
FHP - INTERGAL HORSEPOWER MANUAL CONTROLLER				M-METER
ECM - ELECTRONICALLY COMMUTATED MOTOR				

EQUIPMENT	EQUIPMENT DESCRIPTION	LOCATION	LOAD							BRANCH WIRING				STARTER					DISCONNECT TYPE AND RATING			NEMA ENCLOSURE	KEYED NOTE(S)
			KW	HP	FLA (AMPS)	MCA (AMPS)	MOCP (AMPS)	VOLTS	PHASE	NO.	SIZE	GND.	C	TYPE	NEMA SIZE	FURNISHED/ INSTALLED BY	NEMA ENCLOSURE	ACC.	TYPE	RATING / FUSE	FURNISHED/ INSTALLED BY		
DF-1	DESTRAT FAN	BAGGAGE EXPANSION	-	1/10	6	7.2	20	120	1	2	12	12	3/4"	VFD	-	MFR	-	-	MX	20 / -	EC / EC	1	1
AHU-1	AIR HANDLING UNIT	GRADE	-	-	12	13	15	480	3	3	12	12	3/4"	-	-	-	-	-	MFR	-	MC / EC	3R	
MCP3 PDP	BAGGAGE HANDLING EQUIP CONTROL PANEL	BAGGAGE EXPANSION	-	-	45	54	100	480	3	4	3	8	1-1/2"	-	-	-	-	-	MFR	-	-	-	2,8
MCP4 PDP	BAGGAGE HANDLING EQUIP CONTROL PANEL	BAGGAGE EXPANSION	-	-	67	80.4	100	480	3	4	3	8	1-1/2"	-	-	-	-	-	MFR	-	-	-	2,8
EDS	EXPLOSION DETECTION SCANNER	BAGGAGE EXPANSION	-	-	10	12	30	208	1	3	10	10	1"	-	-	-	-	-	-	-	-	-	3,7
PVS	PRIMARY VIEWING STATION	BAGGAGE EXPANSION	-	-	8	9.6	20	120	1	2	12	12	3/4"	-	-	-	-	-	-	-	-	-	4,7
SVS	SECONDARY VIEWING STATION	BAGGAGE EXPANSION	-	-	8	9.6	20	120	1	2	12	12	3/4"	-	-	-	-	-	-	-	-	-	4,7
ETD	EXPLOSIVE TRACE DETECTION (COUNTER MOUNT)	BAGGAGE EXPANSION	-	-	4	4.8	20	120	1	2	12	12	3/4"	-	-	-	-	-	-	-	-	-	5,7
WS	WORKSTATION (TYPICAL)	BAGGAGE EXPANSION	-	-	3	3.6	20	120	1	2	12	12	3/4"	-	-	-	-	-	-	-	-	-	6,7

EQUIPMENT SCHEDULE GENERAL NOTES:

1. ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTIONS FOR COMPLETE INSTALLATION.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DRAWINGS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
4. PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. INCLUDE STARTERS, DISCONNECTS AND OVERLOAD PROTECTION IF NOT INCLUDED IN DIVISION 22 OR 23 SPECIFICATIONS. COORDINATE WITH ALL DIVISION 22 AND 23 SPECIFICATIONS.
5. MOTORS CONNECTED TO EMERGENCY SYSTEMS. BRANCH CIRCUIT WIRING SHALL BE INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
6. THIS CONTRACTOR SHALL VERIFY WITH MECHANICAL CONTRACTOR, ELECTRICAL REQUIREMENTS INCLUDING VOLTAGES, HORSE POWER, DISCONNECTING MEANS, STARTERS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, FUSIBLE SWITCHES AND STARTERS.
7. ALL INTERLOCKING REQUIRED BY THE DRIVE MANUFACTURER BETWEEN THE VARIABLE FREQUENCY DRIVE AND THE DISCONNECT SWITCHES SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
8. THIS CONTRACTOR SHALL PROVIDE ALL BRANCH CIRCUIT POWER WIRING BETWEEN NEW PACKAGED OUTDOOR AIR COOLED CONDENSING UNIT (ACCU) AND INDOOR FAN COIL UNIT (FCU) AS SHOWN ON FLOOR PLANS. THE TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING IN A SEPARATE CONDUIT BETWEEN THE OUTDOOR AND INDOOR UNITS AS REQUIRED BY THE SPECIFIC MANUFACTURER'S INSTALLATION WIRING DIAGRAMS .
9. VERIFY ALL PLUG CONFIGURATIONS, OVERCURRENT PROTECTION RATINGS AND EQUIPMENT FULL LOAD AMPS (FLA) WITH TSA AND BHS EQUIPMENT FURNISHED PRIOR TO ROUGH IN

EQUIPMENT SCHEDULE KEYED NOTES:

1. DRIVE MOUNTED TO FAN MOTOR BY MFR. EC TO PROVIDE MANUFACTURER RECOMMENDED CONTROL SWITCH STATION AND ASSOCIATED WIRING.
2. EC TO PROVIDE LINE SIDE WIRING TO CONTROL PANEL. ALL CONNECTIONS DOWNSTREAM LINE SIDE CONNECTION, INCLUDING BUT NOT LIMITED TO, WIRING TO CONVEYOR MOTORS, WIRING TO X-RAY EQUIPMENT, E-STOP WIRING, ETC. SHALL BE PROVIDED BY BAGGAGE EQUIPMENT CONTRACTOR UNLESS OTHERWISE NOTED.
3. PROVIDE NEMA L6-30R INSTALLED IN FLOOR BOX. COORDINATE ROUGH IN LOCATION WITH EQUIPMENT TO ENSURE FLOOR BOX IS ACCESSIBLE TO RECEIVE MANUFACTURER PLUG
4. PROVIDE ONE (1) QUADRAPLEX RECEPTACLE IN FLOOR BOX. COORDINATE ROUGH IN LOCATION WITH EQUIPMENT TO ENSURE FLOOR BOX IS ACCESSIBLE FOR WORKSTATION/MONITOR PLUGS
5. PROVIDE ONE (1) DUPLEX RECEPTACLE FOR ETD EQUIPMENT. INSTALL NEMA 5-20R IN FLOOR BOX. BOTH ETD RECEPTACLES SHALL SHARE A COMMON FLOOR BOX
6. TYPICAL CONNECTION - PROVIDE ONE (1) QUADRAPLEX RECEPTACLE. A MAXIMUM OF TWO (2) WORKSTATIONS MAY SHARE A COMMON CIRCUIT.
7. TAGS ON PLANS NOTED WITH "(F)" INDICATE FUTURE PROVISIONS. PROVIDE RACEWAY, CIRCUIT BREAKER AND PULL STRING. CAP OR COVER ANY OPENINGS/BOXES FOR FUTURE USE.
8. VERIFY WIRE SIZING AND CIRCUIT BREAKER REQUIREMENTS WITH MCP SHOP DRAWINGS WHEN AVAILABLE

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SCHEDULES

SHEET NO.:
E-601

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LUMINAIRE SCHEDULE

DES	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	LED DATA	VOLTAGE	MOUNTING	DRIVER TYPE	Apparent Load	LUMENS	ACCEPTACLE MANUFACTURERS	KEYED NOTES
G1	LITHONIA	FEM L48 12000LM IMAFL MD MVOLT GZ10 40K 90CRI	4FT LED INDUSTRIAL GASKETED PENDANT, IP65, 10% 0-10V DIM, ACRYLIC LINEAL RUBBED FROSTED LENS, 90CRI	LED, 4000K	277 V	P	A	75 VA	9232	FUNCTIONAL EQUIVALENT	1
G1E	LITHONIA	FEM L48 12000LM IMAFL MD MVOLT GZ10 40K 90CRI	4FT LED INDUSTRIAL GASKETED PENDANT, IP65, 10% 0-10V DIM, ACRYLIC LINEAL RUBBED FROSTED LENS, 90CR WITH INTEGRAL GENERATOR TRANSFER DEVICE	LED, 4000K	277 V	P	EP	75 VA	9232	FUNCTIONAL EQUIVALENT	1
K1E	LUMARK	XTOR1B-Y-PC2	LED WALL PACK WITH GENERATOR TRANSFER DEVICE, BLACK POWDER COATED FINISH, TITLE 24 COMPLIANT	LED, 5000K	277 V	W	EP	50 VA	1418	FUNCTIONAL EQUIVALENT	1
K2	MCGRAW-EDISON	TT-D4-740-U-MQ	LED ROUND SURFACE MOUNT, MEDIUM DISTRIBUTION, 0-10V DIMMING, WET LOCATION LISTED, MEDIUM DISTRIBUTION, TITLE 24 COMPLIANT	LED, 4000K	277 V	S	A	58 VA	8002	FUNCTIONAL EQUIVALENT	1
X1	LITHONIA	TCC-RG-350L	WALL MOUNT EXIT SIGN, STEEL HOUSING, RED LETTERING, NO ARROW WITH INTEGRAL BATTERY AND INTEGRAL LED HEADS	W/ UNIT	277 V	W	EB	7 VA	371	FUNCTIONAL EQUIVALENT	

MOUNTING (MTG):

CV = COVE
ES = EXPOSED STRUCTURE
O = OTHER
P = PENDANT
PL = POLE
R = RECESSED
S = SURFACE
SP = SUSPENDED
UC = UNDERCOUNTER
V = VARIES
W = WALL MOUNTED

BALLAST/DRIVER: (SEE SPECIFICATIONS)

A LED DIMMABLE DRIVER (0-10V) - 10% DIM

B LED DIMMABLE DRIVER (0-10V) - 1% DIM

C LED DIMMABLE DRIVER (ELV)

D LED NON-DIMMABLE DRIVER

EB EMERGENCY - BATTERY BACKUP

EP EMERGENCY - INTEGRAL POWER TRANSFER DEVICE

F LED STEP-DIMMING DRIVER

G DALI DIMMING DRIVER

H LED DMX DRIVER

J MULTI-VOLTAGE DRIVER

LUMINAIRE SCHEDULE GENERAL NOTES:

1. REFER TO DIVISION 26 SPECIFICATIONS FOR ADDITIONAL INFORMATION BEFORE ORDERING.
2. ALL LED LUMINAIRES MUST COMPLY WITH LM-79 AND LM-80 TESTING STANDARDS. L70 LIFE SHALL HAVE A MINIMUM OF 50,000 HOURS.
3. ANY PROPOSED SUBSTITUTIONS MUST BE SUBMITTED WITH PHOTOMETRIC CALCULATIONS AND CATALOG SHEETS WITH DATA TO PROVE EQUAL CHARACTERISTICS. PROVIDE PHYSICAL SAMPLES OF PROPOSED SUBSTITUTIONS UPON REQUEST.
4. EC SHALL VERIFY AND COORDINATE ALL LUMINAIRE TRIMS/FLANGES WITH RESPECTIVE CEILING TYPES SCHEDULED AND/OR SUBMITTED BY THE GC PRIOR TO ORDERING OF THE LUMINAIRES. SCHEDULE INDICATES TRIM TYPES BASED ON THE GENERIC CEILING INFORMATION AVAILABLE AT THE TIME BIDDING DOCUMENTS WERE ISSUED AND DOES NOT REFLECT ACTUAL THICKNESS OF GYPSUM WALL BOARD OR PLASTER CEILING OR EXACT GRID TYPE SPECIFIED BY THE ARCHITECT.

LUMINAIRE SCHEDULE KEYED NOTES:

1. WET LOCATION, GASKETED

BRANCH PANEL: L1CC

LOCATION:
SUPPLY FROM: LB1CC
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTS: 120/208 WYE
PHASES: 3
WIRES: 4
GROUND & NEUTRAL:

S.C.C.R. RATING: 10kA
MAINS TYPE: MCB
MAINS RATING: 110 A
BUSS RATING: 225 A

NOTES:

KEY	CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CKT	KEY
	1	EXTERIOR RECEPS	20 A	1	180	0								2	
	3	RM 101B - WEST END RECEP	20 A	1			540	0			3	30 A	SPARE	4	
	5	RM 101B - EAST END RECEP	20 A	1					360	0				6	
	7	EDS - WEST	30 A	2	2184	0								8	
	9						2184	0			3	20 A	SPARE	10	
	11	EDS - EAST (F)	30 A	2					2184	0				12	
	13				2184	0					1	20 A	SPARE	14	
	15	PVS - WEST	20 A	1			960	0			1	20 A	SPARE	16	
	17	PVS - EAST (F)	20 A	1					960	0	1	20 A	SPARE	18	
	19	ETD'S	20 A	1	720	0					1	20 A	SPARE	20	
	21	SVS - WEST	20 A	1			720	0			1	20 A	SPARE	22	
	23	SVS - EAST (F)	20 A	1					720	0	1	20 A	SPARE	24	
	25	WORKSTATIONS	20 A	1	360	0					1	20 A	SPARE	26	
	27	WORKSTATIONS	20 A	1			360	0			1	20 A	SPARE	28	
	29	OVERSIZED BAG SCREEN	20 A	1					720	0	1	20 A	SPARE	30	
	31	DF-1	20 A	1	720	0					1	20 A	SPARE	32	
	33	CANOPY RECEPS	20 A	1			540	0			1	20 A	SPARE	34	
	35	AHU-1 RECEP	20 A	1					180	0	1	20 A	SPARE	36	
	37	EXTERIOR RECEP	20 A	1	360	0					1	20 A	SPARE	38	
	39	EXTERIOR RECEP	20 A	1			180	0			1	20 A	SPARE	40	
	41	EXTERIOR RECEP	20 A	1					180	0	1	20 A	SPARE	42	
			TOTAL LOAD:		6708 VA		5484 VA		5304 VA						
			TOTAL AMPS:		56 A		46 A		44 A						

KEY: A = HACR; C = THRU CONTACTOR; E = EXISTING BREAKER; G = GFCI; H = HANDLE LOCK; I = ISOLATED GROUND; P = PADLOCK HASP; S = SHUNT TRIP

LOAD CLASSIFICATIONS	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Fans	720 VA	125.00%	900 VA		
Receptacle	2520 VA	100.00%	2520 VA		
Other	720 VA	100.00%	720 VA	**TOTAL CONN. LOAD:**	17496 VA
Cool	360 VA	125.00%	450 VA	**TOTAL DEMAND LOAD:**	17766 VA
Power	13176 VA	100.00%	13176 VA	**TOTAL DESIGN LOAD:**	17766 VA
				NON-COINCIDENTAL HVAC CURRENT:	0 A
				TOTAL CONN. CURRENT:	49 A
				TOTAL DEMAND CURRENT:	49 A
				TOTAL DESIGN CURRENT:	49 A

Panelboard: Panel L1SA

Bus Ampacity	600	Volts	480Y/277	Panel Source:	MSB
Branch Brkr Space	42 Poles	Phase	3	Feed-Thru Lugs	None
Main Type	MLO	Wires	4		
MCB Amps	-	Delta/Wye	Wye	Sub-Feed Lugs	None
		Mounting	Surface		
		Enclosure	NEMA 1	Sub-Feed Brkr #1	None
		SCCR	35 kA		
		SE Rated	No	Sub-Feed Brkr #2	None
		Pnl MCA	392 A		
Comments:				SPD	
				Iso Grd	

Key Note	Load Description	Cct No	Brkr A/P	Left Side A	Left Side B	Left Side C	Right Side A	Right Side B	Right Side C	Brkr A/P	Cct No	Load Description	Key Note
E	PANEL A1SA	1	250/3	24,948				6,600		50/3	2	PANEL L1CA VIA XFM	E
	|	3	|		27,795					|	4	|	
	|	5	|			25,656			4,980	|	6	|	
E	PANEL L1SB	7	200/3	37,428			0			200/3	8	SPARE	E
	|	9	|		39,312			0		|	10	|	
	|	11	|			33,772			0	|	12	|	
E	VAVAC-4 (CKT 2, ROOF)	13	20/3	3,048			3,048			20/3	14	VAVAC-3 (CKT 2, ROOF)	E
	|	15	|		3,048			3,048		|	16	|	
	|	17	|			3,048			3,048	|	18	|	
E	VAVAC-2 (CKT 2, ROOF)	19	20/3	3,048			3,048			20/3	20	VAVAC-2 (CKT 2, ROOF)	E
	|	21	|		3,048			3,048		|	22	|	
	|	23	|			3,048			3,048	|	24	|	
E	BHS MCP2 PDP	25	50/3	10,000			0			400/3	26	SPARE	E
	|	27	|		10,000			0		|	28	|	
	|	29	|			10,000			0	|	30	|	
E	SPARE	31	200/3	0			0			20/3	32	SPARE	E
	|	33	|		0			0		|	34	|	
	|	35	|			0			0	|	36	|	
E	SPARE	37	20/3	0				17,496		250/3	38	L1SC	
	|	39	|		0			17,766		|	40	|	
	|	41	|			0			17,766	|	42	|	

Key Notes:A=HACR G=GFI H=HANDLE LOCK C=THRU CONTACTOR I=ISOLATED GRD S=SHUNT TRIP P=PADLOCK HASP D=HID LIGHTING E=EXISTING

1

BRANCH PANEL: L1SC

LOCATION:
SUPPLY FROM: L1SA
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTS: 480/277 WYE
PHASES: 3
WIRES: 4
GROUND & NEUTRAL:

S.C.C.R. RATING: 35kA
MAINS TYPE: MCB
MAINS RATING: 250 A
BUSS RATING: 250 A

NOTES:

KEY	CKT	CIRCUIT DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	CIRCUIT DESCRIPTION	CKT	KEY
	1				3536	0								2	
M	3	AHU-1	15 A	3			3536	0			3	20 A	SPARE	4	
	5								3536	0				6	
	7				12240	0								8	
M	9	MCP3 PDP	100 A	3			12240	0			3	50 A	SPARE	10	
	11								12240	0				12	
	13				18224	--					1	--	SPACE	14	
M	15	MCP4 PDP	100 A	3			18224	--			1	--	SPACE	16	
	17								18224	--	1	--	SPACE	18	
	19				6708	--					1	--	SPACE	20	
	21	LB1CC	50 A	3			5484	--			1	--	SPACE	22	
	23								5304	--	1	--	SPACE	24	
	25				0	--					1	--	SPACE	26	
	27	SPARE	100 A	3			0	--			1	--	SPACE	28	
	29								0	--	1	--	SPACE	30	
			TOTAL LOAD:		40708 VA		39484 VA		39304 VA						
			TOTAL AMPS:		147 A		143 A		142 A						

KEY: A = HACR; C = THRU CONTACTOR; E = EXISTING BREAKER; G = GFCI; H = HANDLE LOCK; I = ISOLATED GROUND; P = PADLOCK HASP; S = SHUNT TRIP; M = BREAKER...

LOAD CLASSIFICATIONS	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Fans	720 VA	125.00%	900 VA		
Receptacle	2520 VA	100.00%	2520 VA		
Panel	91392 VA	125.00%	114240 VA	**TOTAL CONN. LOAD:**	119496 VA
Other	720 VA	100.00%	720 VA	**TOTAL DEMAND LOAD:**	145176 VA
Cool	10968 VA	124.18%	13620 VA	**TOTAL DESIGN LOAD:**	145176 VA
Power	13176 VA	100.00%	13176 VA	**NON-COINCIDENTAL HVAC CURRENT:**	0 A
				TOTAL CONN. CURRENT:	144 A
				TOTAL DEMAND CURRENT:	175 A
				TOTAL DESIGN CURRENT:	175 A

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT (SBP)
BAGGAGE SCREENING MODS.
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

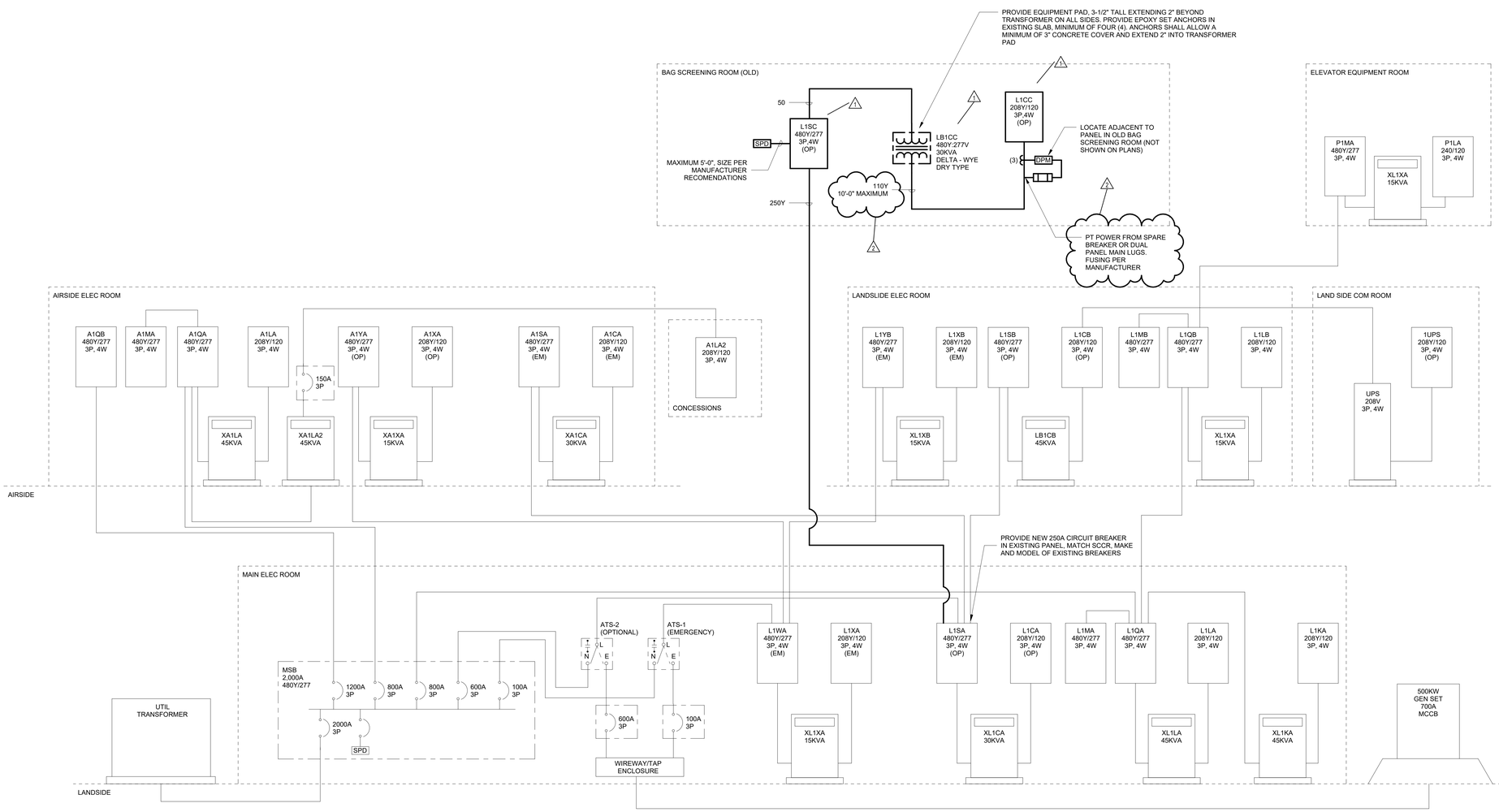
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SHEET CONTENTS
SCHEDULES

SHEET NO.:
E-602

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1 ONE-LINE POWER DIAGRAM

NO SCALE

COPPER BRANCH CIRCUIT & FEEDER SCHEDULE

MARK	AMPACITY	NO. OF SETS	CONDUCTOR SIZES (AWG or KCMIL)				CONDUIT SIZE
			PHASE	NEUTRAL	EQ GND	ISO GND	
20	20	1	3 - # 12	-	1 - # 12	-	1/2"
20Y	20	1	3 - # 12	1 - # 12	1 - # 12	-	1/2"
25	25	1	3 - # 10	-	1 - # 10	-	1/2"
25Y	25	1	3 - # 10	1 - # 10	1 - # 10	-	1/2"
30	30	1	3 - # 10	-	1 - # 10	-	3/4"
30Y	30	1	3 - # 10	1 - # 10	1 - # 10	-	3/4"
35	35	1	3 - # 8	-	1 - # 10	-	3/4"
35Y	35	1	3 - # 8	1 - # 8	1 - # 10	-	3/4"
40	40	1	3 - # 8	-	1 - # 10	-	3/4"
40Y	40	1	3 - # 8	1 - # 8	1 - # 10	-	1"
45	45	1	3 - # 6	-	1 - # 10	-	1"
45Y	45	1	3 - # 6	1 - # 6	1 - # 10	-	1"
50	50	1	3 - # 6	-	1 - # 10	-	1"
50Y	50	1	3 - # 6	1 - # 6	1 - # 10	-	1-1/4"
60	60	1	3 - # 4	-	1 - # 10	-	1-1/4"
60Y	60	1	3 - # 4	1 - # 4	1 - # 10	-	1-1/4"
70	70	1	3 - # 4	-	1 - # 8	-	1-1/4"
70Y	70	1	3 - # 4	1 - # 4	1 - # 8	-	1-1/4"
80	80	1	3 - # 3	-	1 - # 8	-	1-1/4"
80Y	80	1	3 - # 3	1 - # 3	1 - # 8	-	1-1/4"
90	90	1	3 - # 3	-	1 - # 8	-	1-1/4"
90Y	90	1	3 - # 3	1 - # 3	1 - # 8	-	1-1/4"
100	100	1	3 - # 3	-	1 - # 8	-	1-1/4"
100Y	100	1	3 - # 3	1 - # 3	1 - # 8	-	1-1/4"
110	110	1	3 - # 2	-	1 - # 6	-	1-1/4"
110Y	110	1	3 - # 2	1 - # 2	1 - # 6	-	1-1/4"
125	125	1	3 - # 1/0	-	1 - # 6	-	1-1/2"
125Y	125	1	3 - # 1/0	1 - # 1/0	1 - # 6	-	2"
150	150	1	3 - # 1/0	-	1 - # 6	-	1-1/2"
150Y	150	1	3 - # 1/0	1 - # 1/0	1 - # 6	-	2"
175	175	1	3 - # 2/0	-	1 - # 6	-	2"
175Y	175	1	3 - # 2/0	1 - # 2/0	1 - # 6	-	2"
200	200	1	3 - # 3/0	-	1 - # 6	-	2"
200Y	200	1	3 - # 3/0	1 - # 3/0	1 - # 6	-	2-1/2"
225	225	1	3 - # 4/0	-	1 - # 4	-	2"
225Y	225	1	3 - # 4/0	1 - # 4/0	1 - # 4	-	2-1/2"
250	250	1	3 - 250	-	1 - #4	-	2-1/2"
250Y	250	1	3 - 250	1 - 250	1 - #4	-	3"
300	300	1	3 - 350	-	1 - # 4	-	3"
300Y	300	1	3 - 350	1 - 350	1 - # 4	-	3-1/2"
350	350	1	3 - 500	-	1 - # 3	-	3"
350Y	350	1	3 - 500	1 - 500	1 - # 3	-	3-1/2"
380	380	1	3 - 500	-	1 - # 3	-	3"
380Y	380	1	3 - 500	1 - 500	1 - # 3	-	3-1/2"
400	400	2	3 - # 3/0	-	1 - # 3	-	2"
400Y	400	2	3 - # 3/0	1 - # 3/0	1 - # 3	-	2-1/2"
450	450	2	3 - # 4/0	-	1 - # 2	-	2"
450Y	450	2	3 - # 4/0	1 - # 4/0	1 - # 2	-	2-1/2"
500	500	2	3 - 250	-	1 - # 2	-	2-1/2"
500Y	500	2	3 - 250	1 - 250	1 - # 2	-	3"
600	600	2	3 - 350	-	1 - # 1	-	3"
600Y	600	2	3 - 350	1 - 350	1 - # 1	-	3"
700	700	2	3 - 500	-	1 - # 1/0	-	3"
700Y	700	2	3 - 500	1 - 500	1 - # 1/0	-	3-1/2"
800	800	2	3 - 500	-	1 - # 1/0	-	3"
800Y	800	2	3 - 500	1 - 500	1 - # 1/0	-	3 - 1/2"
1000	1000	3	3 - 400	-	1 - # 2/0	-	3"
1000Y	1000	3	3 - 400	1 - 400	1 - # 2/0	-	3-1/2"
1200	1200	4	3 - 350	-	1 - # 3/0	-	3"
1200Y	1200	4	3 - 350	1 - 350	1 - # 3/0	-	3"
1600	1600	5	3 - 400	-	1 - # 4/0	-	3"
1600Y	1600	5	3 - 400	1 - 400	1 - # 4/0	-	3 - 1/2"
2000	2000	6	3 - 400	-	1 - 250	-	3"
2000Y	2000	6	3 - 400	1 - 400	1 - 250	-	3 - 1/2"
2500	2500	7	3 - 500	-	1 - 350	-	3 - 1/2"
2500Y	2500	7	3 - 500	1 - 500	1 - 350	-	4"
3000	3000	8	3 - 500	-	1 - 400	-	3 - 1/2"
3000Y	3000	8	3 - 500	1 - 500	1 - 400	-	4"
4000	4000	11	3 - 500	-	1 - 500	-	3 - 1/2"
4000Y	4000	11	3 - 500	1 - 500	1 - 500	-	4"

SCHEDULE NOTES:

1. THE SCHEDULE IS A SCHEDULE OF TYPICAL FEEDERS AND SOME OF THE SIZES MAY NOT APPLY TO THIS PROJECT.
2. ALL THE CONDUCTOR AMPACITIES ARE BASED ON TABLE [310.16] [310.15(B)(16)] OF THE NEC FOR COPPER CONDUCTORS (75 DEGREE CELSIUS CHART).
3. FEEDER SIZES SHOWN ON THE RISER DIAGRAM INDICATE FEEDER AMPACITIES AND DO NOT NECESSARILY CORRESPOND TO THE CIRCUIT BREAKER AMPACITIES. CERTAIN FEEDERS MAY BE SIZED FOR DERATION FACTORS AND/OR OVERSIZED FOR VOLTAGE DROP PER NEC REQUIREMENTS.

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SHEET CONTENTS
ONE-LINE DIAGRAM

SHEET NO.:
E-701

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SECURITY SYSTEM SYMBOLS

ACCESS CONTROL SYMBOLS:

- ACD — ACCESS CONTROLLED DOOR. REFER TO ACCESS CONTROLLED DOOR SCHEDULE FOR ADDITIONAL INFORMATION.
- ACP — ACCESS CONTROL PANEL
- DIB — DOOR INTERFACE BOX
- CK — CARD READER WITH KEYPAD
- MB — MEDIA BOX
- ANTENNA

AUDIO VISUAL SYMBOLS

- S — LOUDSPEAKER - HORN TYPE

GENERAL SYMBOLS

- X/T-XXX — DETAIL NUMBER / SHEET NUMBER
- 9.XXX — KEYED NOTE, USED TO DESCRIBE ADDITIONAL INFORMATION OF WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL IT IS SHOWN WITH
- IT ROOM / 116 — ROOM NAME AND NUMBER
- 102A — DOOR IDENTIFICATION
- 1 / T-40X — BUILDING SECTION
- 1 / T-40X — ENLARGED PLAN
- T-40X / 1 — INTERIOR ELEVATION

TECHNOLOGY OUTLET SCHEDULE

SYMBOL	DESCRIPTION	MOUNTING	COMMENTS
▼	TWO-PORT TECHNOLOGY OUTLET: - (1) 1" CONDUIT - (1) 4-11/16" SQUARE x 2-5/8" DEEP BACKBOX WITH SINGLE GANG TRIM RING - (1) SINGLE-GANG, TWO-PORT FACEPLATE - (2) CATEGORY 6 JACKS - (2) CATEGORY 6 CABLES	18" AFF TO CENTER OF BOX U.N.O.	- RUN CONDUIT TO MB WITHIN SPRUNG STRUCTURE.
CA ▽	TECHNOLOGY OUTLET FOR VIDEO SURVEILLANCE CAMERA: - (1) 1" CONDUIT STUB - (1) 4-11/16" SQUARE x 2-5/8" DEEP BACKBOX WITH SINGLE-GANG TRIM RING - (1) CATEGORY 6 JACK - (1) SHIELDED CATEGORY 6 CABLE	USE WEATHERPROOF BOX FOR CANOPY LOCATION	- BOX OR SINGLE-PORT SURFACE HOUSING AS NECESSARY TO MEET INSTALLATION CONDITIONS
FP ▼	FLAT-PANEL DISPLAY TECHNOLOGY OUTLET: - (1) 1" CONDUIT STUB - (1) 4-11/16" SQUARE x 2-5/8" DEEP BACKBOX WITH SINGLE GANG TRIM RING - (1) SINGLE-GANG, TWO-PORT FACEPLATE - (2) CATEGORY 6 JACKS - (2) CATEGORY 6 CABLES	12" ABOVE HORIZONTAL CENTERLINE OF FLAT PANEL DISPLAY U.N.O.	- RUN CONDUIT TO MB WITHIN SPRUNG STRUCTURE.
AP ▼	WIRELESS ACCESS POINT TECHNOLOGY OUTLET: - (1) 1" CONDUIT STUB - (1) 4-11/16" SQUARE x 2-5/8" DEEP BACKBOX WITH BLANK COVER	- USE WEATHERPROOF BOX & COVER - INCLUDE 30' COILED SLACK CABLE FOR AP LOCATION ADJUSTMENT	

TECHNOLOGY OUTLET SCHEDULE NOTES:

1. REFER TO DIVISION 26 SPECIFICATIONS FOR BOX AND CONDUIT SPECIFICATIONS AND EXECUTION REQUIREMENTS.
2. REFER TO DIVISION 27 SPECIFICATIONS FOR LOW-VOLTAGE CABLING PATHWAY REQUIREMENTS.

VIDEO SURVEILLANCE SYMBOLS

VIDEO SURVEILLANCE CAMERA:

- CAMERA ID: XX
- APPROXIMATE VIEWING DIRECTION: F
- HORIZONTAL VIEWING ANGLE: 90

CAMERA TYPE:
- C: DETENTION CORNER
- F: FIXED W/ VARIFOCAL LENS
- M: MULTISENSOR
- O: FISHEYE
- P: PAN-TILT-ZOOM

MOUNTING MODIFIERS:

- F — WALL MOUNT

LINE TYPE KEY

- NEW WORK BY THIS CONTRACTOR (DARK SOLID LINE)
- EXISTING TO BE REMOVED BY THIS CONTRACTOR (DARK DASHED LINE)
- EXISTING TO REMAIN WORK (THIN SOLID LINE)
- NEW WORK UNDER FLOOR BY THIS CONTRACTOR
- CON — SITE UNDERGROUND CONDUIT

ACCESS CONTROL IDENTIFICATION

TECHNOLOGY ABBREVIATIONS

&	AND
@	AT
A/E	ARCHITECT / ENGINEER
ACS	ACCESS CONTROL SYSTEM
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AHJ	AUTHORITY HAVING JURISDICTION
ALT	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	(WIRELESS) ACCESS POINT
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BET	BUILDING ENTRANCE TERMINAL
BIDS	BAGGAGE INFORMATION DISPLAY SYSTEM
BLDG	BUILDING
C	CONDUIT
CATV	COMMUNITY ANTENNA TELEVISION
CL	CENTERLINE
CLG	CEILING
COAX	COAXIAL
COMM	COMMUNICATIONS
DSS	DIGITAL SATELLITE SERVICE
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
EIA	ELECTRONIC INDUSTRIES ALLIANCE
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NONMETALLIC TUBING
EO	EQUIPMENT OUTLET
ERL	EXISTING TO BE RELOCATED
ERLD	EXISTING - RELOCATED LOCATION
ETR	EXISTING TO REMAIN
F/UTP	FOILED UNSCREENED TWISTED PAIR
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FIDS	FLIGHT INFORMATION DISPLAY SYSTEM
FO	FIBER OPTIC
FPD	FLAT-PANEL DISPLAY
GC	GENERAL CONTRACTOR
GIDS	GATE INFORMATION DISPLAY SYSTEM
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
GRS	GALVANIZED RIGID STEEL
HH	HAND HOLE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
IDF	INTERMEDIATE DISTRIBUTION FRAME
IDS	INTRUSION DETECTION SYSTEM
IMC	INTERMEDIATE METALLIC CONDUIT
IT	INFORMATION TECHNOLOGY
J-BOX	JUNCTION BOX
MAX	MAXIMUM
MDF	MAIN DISTRIBUTION FRAME
MH	MAN HOLE
MIN	MINIMUM
MMFO	MULTIMODE FIBER OPTIC
MNS	MASS NOTIFICATION SYSTEM
MON	MONITOR
MPTL	MODULAR PLUG TERMINATED LINK
MTD	MOUNTED
MTR	MAIN TECHNOLOGY ROOM
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER-FURNISHED, CONTRACTOR-INSTALLED
OFOI	OWNER-FURNISHED, OWNER-INSTALLED
PA	PUBLIC ADDRESS
PTZ	PAN - TILT - ZOOM
PVC	POLYVINYL CHLORIDE
RCV	RECEIVER
REQ'D	REQUIRED
ScTP	SCREENED TWISTED PAIR
SE	SERVICE ENTRANCE
SMFO	SINGLEMODE FIBER OPTIC
SS	STAINLESS STEEL
STP	SHEILDED TWISTED PAIR
TBR	TO BE REMOVED
TC	TECHNOLOGY CONTRACTOR
TFA	TO FLOOR ABOVE
TFB	TO FLOOR BELOW
TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
TIA	TELECOMMUNICATIONS INDUSTRY ASSOCIATION
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
TO	TECHNOLOGY OUTLET
TR	TECHNOLOGY ROOM
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
VMS	VIDEO MANAGEMENT SYSTEM
VSS	VIDEO SURVEILLANCE SYSTEM
WL	WET LOCATION LISTED
WP	WEATHERPROOF

DEMOLITION GENERAL NOTES

1. THE INFORMATION SHOWN IS BASED ON EXISTING DRAWINGS AND SITE OBSERVATIONS TO ASSIST THE CONTRACTOR IN BIDDING. THE CONTRACTOR SHOULD VISIT THE SITE TO VERIFY EXISTING CONDITIONS. THE TECHNOLOGY SYSTEMS DRAWINGS INDICATE EXISTING TECHNOLOGY SYSTEMS ITEMS TO BE REMOVED. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY DEVICE, BOX, CONDUIT, WIRE OR CABLE THAT MUST BE REMOVED.
2. DASHED WALLS ON THE FLOOR PLANS INDICATE EXISTING WALLS BEING DEMOLISHED. REFER TO THE ARCHITECTURAL DEMOLITION PLANS FOR THE EXACT EXTENT OF WORK REQUIRED BY THIS PROJECT. REMOVE ALL DEVICES ON DASHED WALLS NOT SHOWN ON THE CONTRACT DRAWINGS. REFER TO DEMOLITION DRAWINGS OF OTHER TRADES. WHERE CONTROL PANELS AND APPURTENANCES THAT HAVE TECHNOLOGY SYSTEMS CONNECTIONS ARE BEING REMOVED, INCLUDE DISCONNECTION AND REMOVAL OF ALL ASSOCIATED CONDUIT, WIRING AND CABLING.
3. TECHNOLOGY SYSTEMS ITEMS (E.G. TECHNOLOGY OUTLETS, SECURITY SYSTEMS DEVICES, AUDIO DEVICES, CABLE) THAT ARE REMOVED AND NOT RELOCATED SHALL REMAIN THE PROPERTY OF THE OWNER. DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.
4. OBTAIN APPROVAL FROM THE OWNER BEFORE TURNING OFF POWER TO TECHNOLOGY SYSTEMS EQUIPMENT OR DEVICES. COORDINATE ALL OUTAGES WITH THE OWNER.
5. PROVIDE A BLANK COVERPLATE FOR ALL BOXES IN EXISTING MASONRY WALLS THAT ARE TO REMAIN IN PLACE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH TYPE AND ATTACHMENT.
6. REMOVE ALL CONDUIT WHERE WALLS ARE BEING REMOVED. WHERE CONDUIT IS IN THE CONCRETE SLAB, CUT OFF FLUSH, PULL OUT WIRE OR CABLE AND PLUG. WHERE CONDUIT IS RUN EXPOSED, ALL ASSOCIATED CLAMPS, SUPPORTS, HANGERS, ETC. SHALL BE REMOVED.
7. COORDINATE ALL WORK WITH OTHER CONTRACTORS AT THE JOB SITE BEFORE REMOVING EXISTING TECHNOLOGY SYSTEMS ITEMS AND INSTALLING NEW ITEMS.
8. EXISTING CONDUIT IN GOOD CONDITION MAY BE REUSED IN PLACE. RELOCATED EXISTING CONDUIT SHALL NOT BE ALLOWED. CONDUIT CONCEALED IN WALL CONSTRUCTION MAY BE ABANDONED IN PLACE IF NOT AFFECTED BY OTHER CONSTRUCTION.

GENERAL NOTES

1. PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED TO INSTALL COMPLETE TECHNOLOGY SYSTEMS AS INDICATED ON THESE DRAWINGS AND AS SPECIFIED.
2. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE DETAILS OF WORK, VERIFY DIMENSIONS IN THE FIELD, AND ADVISE THE ARCHITECT/ENGINEER OF ANY DISCREPANCY BEFORE PERFORMING ANY WORK.
3. COORDINATE LOCATION AND MOUNTING REQUIREMENTS OF ALL CEILING-MOUNTED OR ABOVE-CEILING-MOUNTED DEVICES WITH REFLECTED CEILING PLAN, LIGHTING LAYOUT, SIGNAGE, AND OTHER CEILING OR ABOVE-CEILING-MOUNTED EQUIPMENT.
4. MOUNT ALL TECHNOLOGY OUTLETS AT HEIGHTS ABOVE FINISHED FLOOR AS SHOWN IN THE TECHNOLOGY OUTLET SCHEDULE U.N.O.
5. ALL TECHNOLOGY RACEWAY (CONDUIT, BACKBOX, SUPPORTS) SHALL BE PROVIDED BY DIVISION 26. SEE DIVISION 26 SPECIFICATIONS FOR GENERAL RACEWAY REQUIREMENTS. ADDITIONAL REQUIREMENTS INCLUDE:
   - PROVIDE A BEND RADIUS OF TEN TIMES THE OUTSIDE DIAMETER OR GREATER FOR ALL TECHNOLOGY RACEWAY.
   - PROVIDE A MINIMUM CONDUIT SIZE OF 1" UNLESS NOTED OTHERWISE
   - PROVIDE PLASTIC OR NYLON BUSHINGS ON ALL CONDUIT STUBS PRIOR TO THE INSTALLATION OF CABLES.
6. MOUNT TECHNOLOGY SYSTEMS EQUIPMENT/DEVICES SO AS TO ALLOW ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF TECHNOLOGY SYSTEMS EQUIPMENT/DEVICES ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR SHALL BE COORDINATED WITH AND APPROVED BY THAT CONTRACTOR IN ADVANCE OF INSTALLATION.
7. PROVIDE ALL OPENINGS REQUIRED IN WALLS. REPAIR ALL OPENINGS TO MATCH EXISTING USING A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. GROUT OR SEAL ALL CONDUITS THROUGH WALLS INTO OPENINGS. FIRESTOP ALL PENETRATIONS THROUGH FLOORS AND FIRE-RATED WALLS IN A MANNER THAT MAINTAINS THE RATING OF THE FLOOR OR WALL PENETRATED.

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BAGGAGE SCREENING MODS

975 Airport Dr, San Luis Obispo, CA 93401

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2	01/28/26	PERMIT REVISIONS

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SHEET CONTENTS
NOTES, SYMBOLS & ABBREVIATIONS

SHEET NO.:
T-001



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TECHNOLOGY KEYED NOTES

9.501 EXISTING ACCESS CONTROL SYSTEM (DIB) DOOR INTERFACE BOX TO REMAIN.

9.502 REMOVE CARD READER/KEYPAD & WIRING BACK TO DIB ABOVE DOOR. SALVAGE FOR REINSTALLATION.

9.503 REMOVE ALL ACCESS CONTROL DEVICES FROM DOOR AND ASSOCIATED CABLING BACK TO DOOR INTERFACE BOX ABOVE DOOR. SALVAGE UNITS FOR REINSTALLATION.

9.504 REMOVE AIRLINE WAP AND ASSOCIATED MOUNTING HARDWARE. REMOVE CABLING BACK TO SOURCE & DOCUMENT TERMINATION POINT. SALVAGE UNIT FOR REINSTALLATION. COORDINATE WITH AIRLINE STAFF FOR ACCESS TO RACK.

9.505 REMOVE SPEAKER AND ASSOCIATED MOUNTING HARDWARE. REMOVE CABLING BACK TO SOURCE & DOCUMENT TERMINATION POINT. SALVAGE UNIT FOR REINSTALLATION.

9.506 FURNISH NEW MUD/PLASTER RING OF THE APPROPRIATE DEPTH TO MATCH FINISHED WALL SURFACE. INSTALL ON EXISTING BACKBOX AND SEAL WALL OPENING AROUND BOX.

9.508 REMOVE AIRLINE WAP AND ASSOCIATED CABLING BACK TO SOURCE IF HOME RUNNED AND COORDINATE WITH AIRLINE STAFF FOR ACCESS TO RACK AND DOCUMENT TERMINATION POINT. LEAVE EXISTING SURFACE BOX AND RUN NEW CABLE FOR TEMPORARY INSTALLATION OF WAP TO EXISTING ANTENNA POLE CLOSEST TO BAGGAGE SCREENING DOOR 101. REUSING EXISTING WAP MOUNT INSTALL TO LOWER SECTION OF PIPE ABOVE LOWER ATTACHMENT TO WALL.

9.509 EXISTING ANTENNA POLE FOR WAP MOUNTING.

9.701 FOR HMI DISPLAY BY OTHERS. REFERENCE T501 FOR ADDITIONAL INFORMATION.

9.702 PROVIDE AND INSTALL NEW 1" CONDUIT TO EXISTING BOX WHERE UNIT WAS PREVIOUSLY LOCATED. CABLE AND DEVICE INSTALL BY AIRLINE.

9.703 PROVIDE AND INSTALL NEW 3/4" CONDUIT TO EXISTING BOX WHERE UNIT WAS PREVIOUSLY LOCATED. TERMINATE NEW CABLE AT PREVIOUS LOCATION IN AUDIO RACK IN COMM/TECH 112.

9.704 PROVIDE AND INSTALL NEW 1-1/2" CONDUIT (VIDEO) USE ELECTRICAL TRAPEZE (SEE E-401) WITH NEW CABLING TO EXISTING VIDEO SURVEILLANCE RACK IN COMM/TECH RM. COORDINATE WITH CLIENT FOR EXACT LOCATION OF RACK.

9.705 PROVIDE AND INSTALL NEW 2" CONDUIT (DATA) ON ELECTRICAL TRAPEZE (E-401) WITH NEW CABLING TO EXISTING AIRPORT NETWORK RACK IN COMM/TECH RM. COORDINATE WITH CLIENT FOR EXACT LOCATION OF RACK.

9.706 PROVIDE AND INSTALL NEW BOX WITH REMOVABLE COVER FOR VIDEO & DATA. SIZE BOX PER NEC TO ACCOMMODATE NEW CONDUITS, RACEWAY AND 25% FUTURE CONDUCTORS. ATTACH TO SPRUNG STRUCTURE FRAMING.

9.707 FURNISH AND INSTALL NEW 1/2" CONDUIT TO NEW EXTENSION BOX AT EXISTING CAMERA LOCATION ON SOUTH WALL. RUN NEW CABLE AND RE-TERMINATE AT SAME LOCATION AS PREVIOUS CAMERA.

9.708 RUN CABLE TO FLOOR BOX AT SCREENING MACHINE.

9.709 MOUNT IN FLOOR BOX. REFERENCE E-401 AND ELECTRICAL SPECIFICATIONS FOR MORE INFORMATION.

9.710 PROVIDE AND INSTALL FLOOR BOX INTERFACE FOR CONNECTION TO NEW SURFACE MOUNT RACEWAY.

9.711 PROVIDE AND INSTALL NEW SURFACE MOUNT RACEWAY. EXTEND TO NEW MEDIA BOX FOR FUTURE FIBER OPTIC CABLE.

9.801 MOUNT ON UNDERSIDE OF CANOPY. RUN NEW 3/4" CONDUIT ON UNDERSIDE OF CANOPY. TO MEDIA BOX IN SPRUNG STRUCTURE.

9.802 INSTALL AND CONNECT SALVAGED CARD READER/ KEYPADS TO EXISTING DIB ABOVE DOOR.

9.803 MOUNT TO SPRUNG STRUCTURE FRAMING. PROVIDE AND INSTALL NEW 1" CONDUIT TO NEW MEDIA BOX WITH ACCESS CONTROL CABLING.

9.804 PROVIDE AND INSTALL NEW BOX WITH REMOVABLE COVER FOR ACCESS CONTROL. SIZE BOX PER NEC TO ACCOMMODATE NEW CONDUITS AND 25% FUTURE CONDUCTORS. ATTACH TO SPRUNG STRUCTURE FRAMING.

9.805 PROVIDE AND INSTALL NEW 2" CONDUIT ON ELECTRICAL TRAPEZE (SEE E-401) WITH ACCESS CONTROL CABLING TO ACCESS CONTROL PANEL IN COMM/TECH RM. COORDINATE WITH CLIENT FOR EXACT LOCATION.

9.806 PROVIDE AND INSTALL NEW CABLE PATHWAY DOWN INTO UNDER FLOOR RACEWAY SYSTEM. REFERENCE E-401 FOR MORE INFORMATION. RUN NEW CABLING IN UNDERGROUND RACEWAY TO NEW "DIB" LOCATED NEXT TO NEW MEDIA BOX.

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BAGGAGE SCREENING MODS

975 Airport Dr, San Luis Obispo, CA 93401

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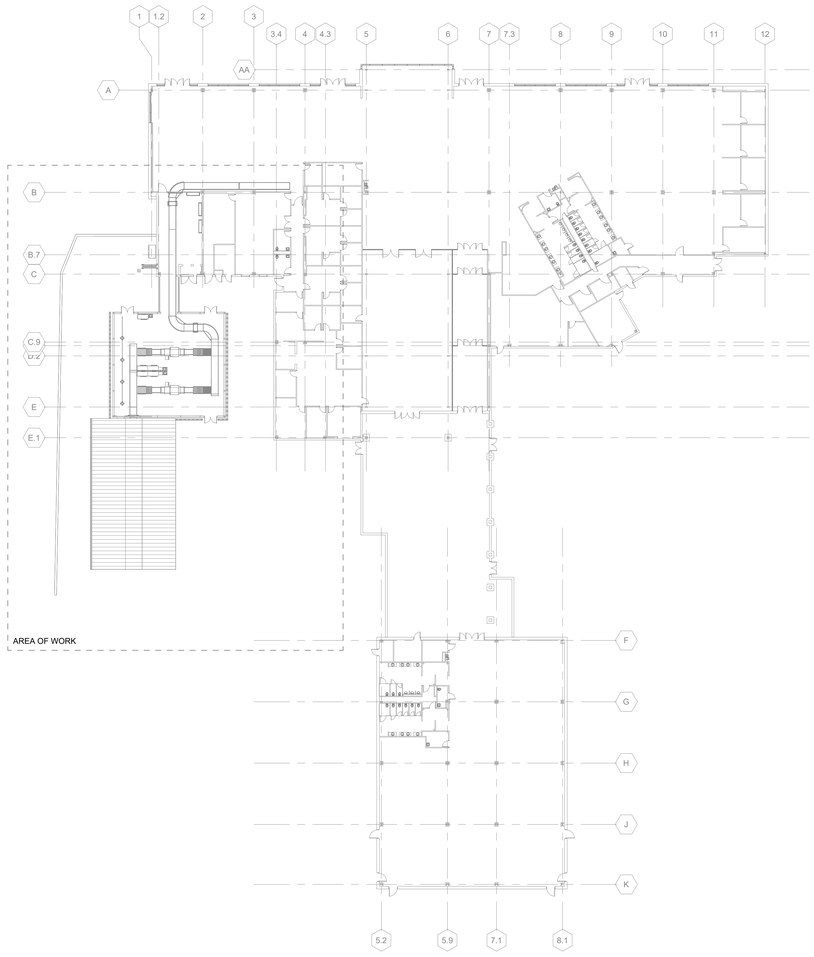
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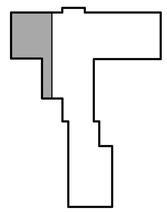
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COMMUNICATIONS GENERAL NOTES

1. REFER TO T-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.
2. REFER TO T-500 SERIES FOR DETAILS, T-600 SERIES FOR SCHEDULES AND RISER DIAGRAMS.



N 1 **FIRST FLOOR OVERALL COMMUNICATIONS PLAN**
1" = 30'-0"



KEY PLAN

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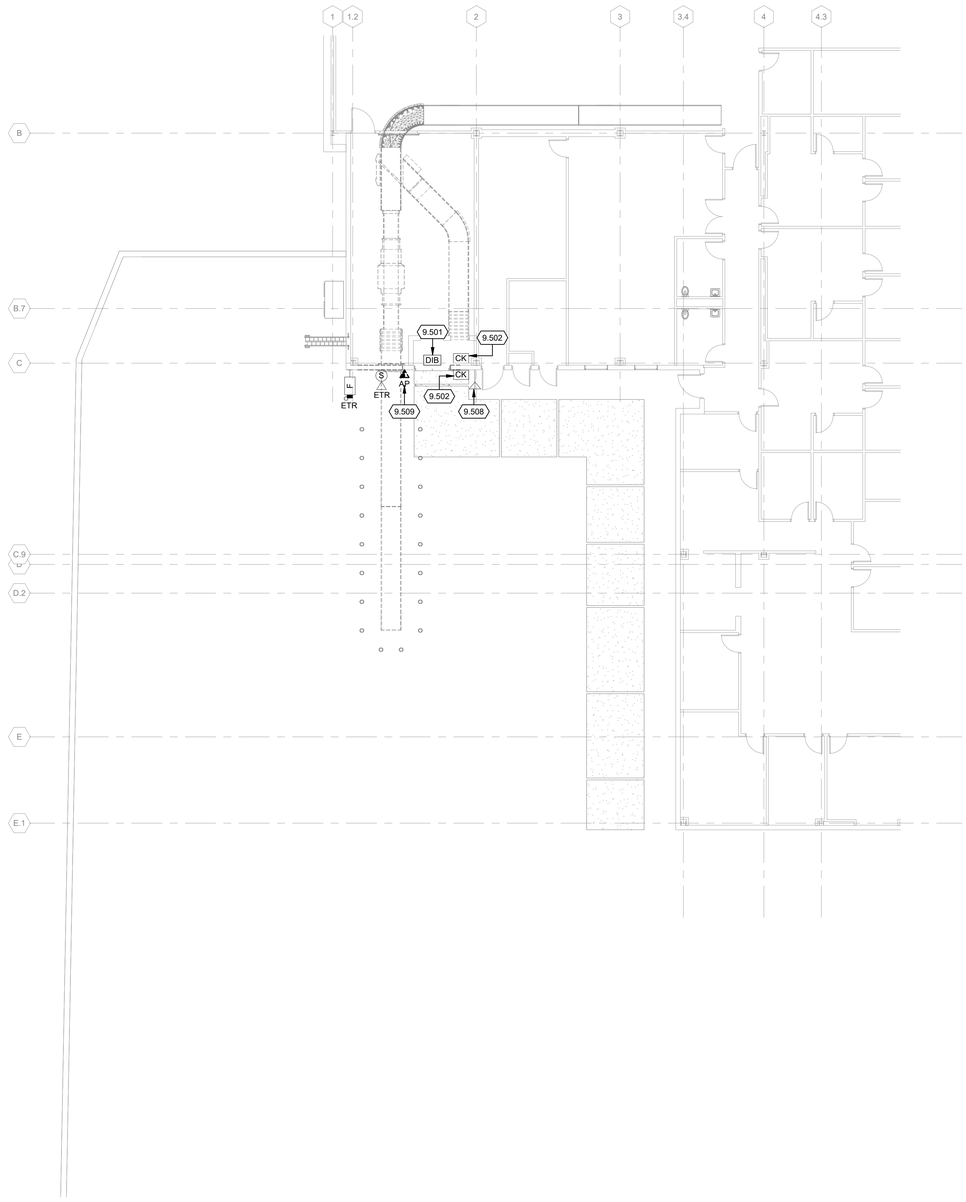
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FIRST FLOOR OVERALL COMMUNICATIONS PLAN

SHEET NO.:
T-011

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N 1 **FIRST FLOOR TECHNOLOGY SYSTEMS DEMOLITION PLAN - PHASE 1**
3/32" = 1'-0"

TECHNOLOGY DEMOLITION NOTES

1. REFER TO ARCHITECTURAL AND ELECTRICAL DEMO DRAWINGS FOR ADDITIONAL INFORMATION.

KEYED NOTES

9.501 EXISTING ACCESS CONTROL SYSTEM (DIB) DOOR INTERFACE BOX TO REMAIN.

9.502 REMOVE CARD READER/KEYPAD & WIRING BACK TO DIB ABOVE DOOR. SALVAGE FOR REINSTALLATION.

9.508 REMOVE AIRLINE WAP AND ASSOCIATED CABLING BACK TO SOURCE IF HOME RUNNED AND COORDINATE WITH AIRLINE STAFF FOR ACCESS TO RACK AND DOCUMENT TERMINATION POINT. LEAVE EXISTING SURFACE BOX AND RUN NEW CABLE FOR TEMPORARY INSTALLATION OF WAP TO EXISTING ANTENNA POLE CLOSEST TO BAGGAGE SCREENING DOOR 101. REUSING EXISTING WAP MOUNT INSTALL TO LOWER SECTION OF PIPE ABOVE LOWER ATTACHMENT TO WALL.

9.509 EXISTING ANTENNA POLE FOR WAP MOUNTING.

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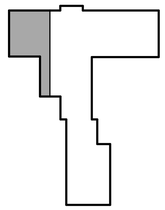
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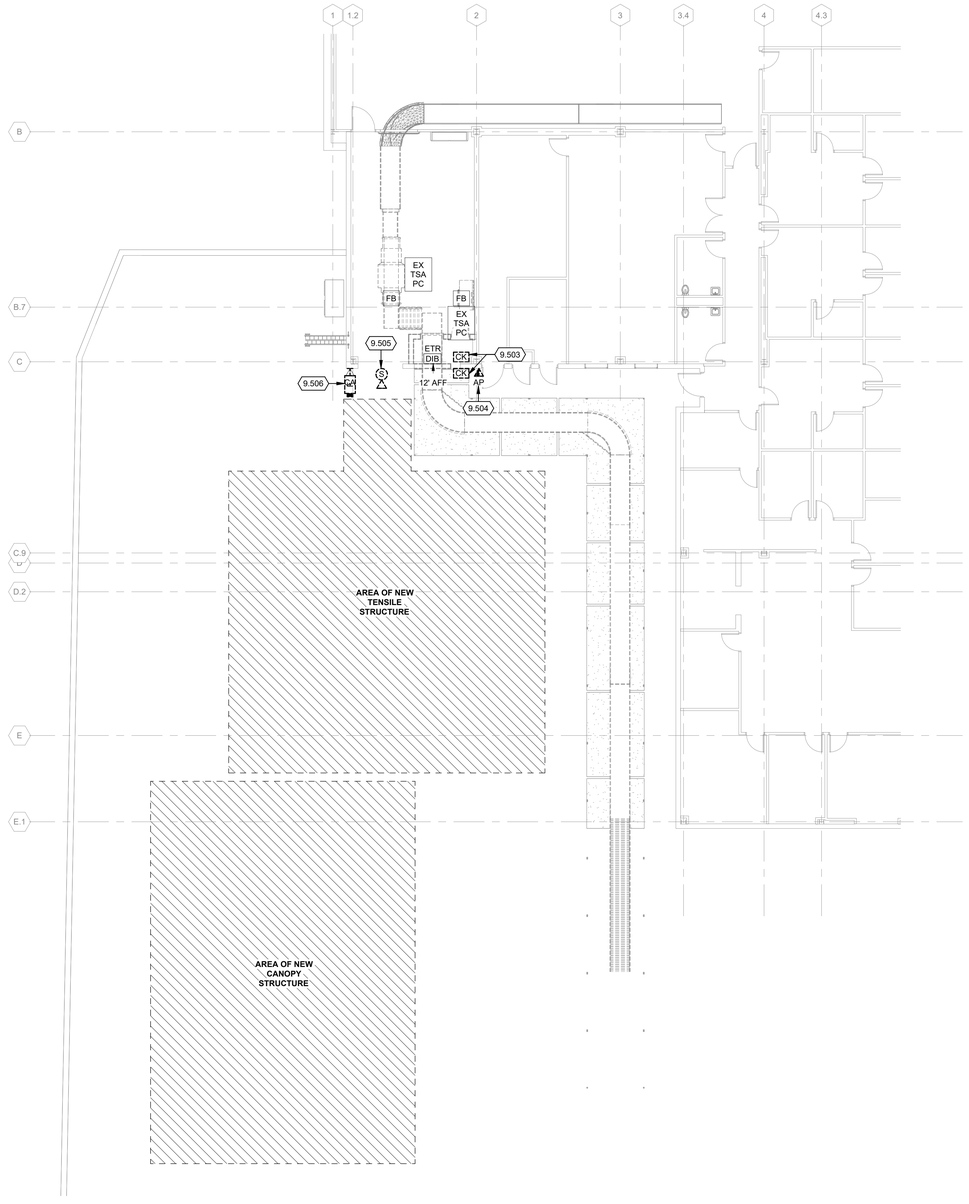
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FIRST FLOOR TECHNOLOGY SYSTEMS DEMOLITION PLAN - PHASE 1

SHEET NO.:

TD101

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N 1 **FIRST FLOOR TECHNOLOGY SYSTEMS DEMOLITION PLAN - PHASE 2**
3/32" = 1'-0"

TECHNOLOGY DEMOLITION NOTES

1. EXISTING BOXES AND CABLE PATHWAY TO REMAIN FOR NEXT PHASE.
2. DELIVER DEVICES TO APPROPRIATE GROUP.

KEYED NOTES

9.503 REMOVE ALL ACCESS CONTROL DEVICES FROM DOOR AND ASSOCIATED CABLING BACK TO DOOR INTERFACE BOX ABOVE DOOR. SALVAGE UNITS FOR REINSTALLATION.

9.504 REMOVE AIRLINE WAP AND ASSOCIATED MOUNTING HARDWARE. REMOVE CABLING BACK TO SOURCE & DOCUMENT TERMINATION POINT. SALVAGE UNIT FOR REINSTALLATION. COORDINATE WITH AIRLINE STAFF FOR ACCESS TO RACK.

9.505 REMOVE SPEAKER AND ASSOCIATED MOUNTING HARDWARE. REMOVE CABLING BACK TO SOURCE & DOCUMENT TERMINATION POINT. SALVAGE UNIT FOR REINSTALLATION.

9.506 FURNISH NEW MUD/PLASTER RING OF THE APPROPRIATE DEPTH TO MATCH FINISHED WALL SURFACE, INSTALL ON EXISTING BACKBOX AND SEAL WALL OPENING AROUND BOX.

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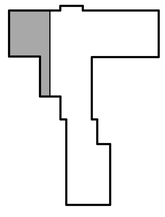
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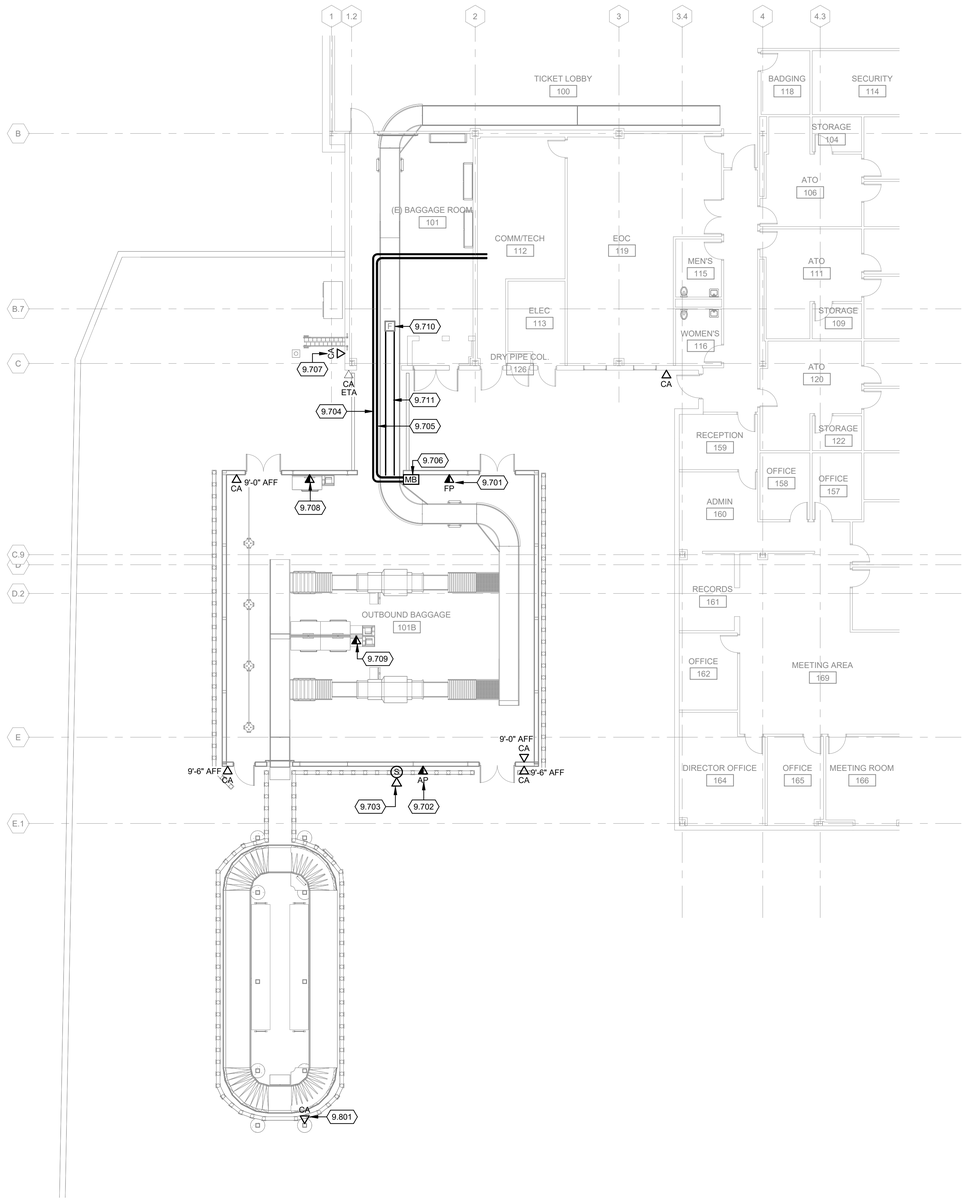
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SHEET CONTENTS
FIRST FLOOR TECHNOLOGY SYSTEMS DEMOLITION PLAN - PHASE 2

SHEET NO.:
TD102

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FIRST FLOOR COMMUNICATIONS PLAN

3/32" = 1'-0"

COMMUNICATIONS GENERAL NOTES

1. REFER TO T-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.
2. REFER TO T-500 SERIES FOR DETAILS, AND T-600 SERIES FOR SCHEDULES, AND RISER DIAGRAMS.
3. ALL DEVICE BOXES & CONDUIT TO BE ATTACHED TO SPRUNG STRUCTURE FRAMING.
4. USE HARDWARE SUITABLE FOR ENVIRONMENT AND AS RECOMMENDED BY SPRUNG STRUCTURE MANUFACTURER.

KEYED NOTES

9.701 FOR HMI DISPLAY BY OTHERS. REFERENCE T501 FOR ADDITIONAL INFORMATION.

9.702 PROVIDE AND INSTALL NEW 1" CONDUIT TO EXISTING BOX WHERE UNIT WAS PREVIOUSLY LOCATED. CABLE AND DEVICE INSTALL BY AIRLINE.

9.703 PROVIDE AND INSTALL NEW 3/4" CONDUIT TO EXISTING BOX WHERE UNIT WAS PREVIOUSLY LOCATED. TERMINATE NEW CABLE AT PREVIOUS LOCATION IN AUDIO RACK IN COMM/TECH 112.

9.704 PROVIDE AND INSTALL NEW 1-1/2" CONDUIT (VIDEO) USE ELECTRICAL TRAPEZE (SEE E-401) WITH NEW CABLING TO EXISTING VIDEO SURVEILLANCE RACK IN COMM/TECH RM. COORDINATE WITH CLIENT FOR EXACT LOCATION OF RACK.

9.705 PROVIDE AND INSTALL NEW 2" CONDUIT (DATA) ON ELECTRICAL TRAPEZE (E-401) WITH NEW CABLING TO EXISTING AIRPORT NETWORK RACK IN COMM/TECH RM. COORDINATE WITH CLIENT FOR EXACT LOCATION OF RACK.

9.706 PROVIDE AND INSTALL NEW BOX WITH REMOVABLE COVER FOR VIDEO & DATA. SIZE BOX PER NEC TO ACCOMMODATE NEW CONDUITS, RACEWAY AND 25% FUTURE CONDUCTORS. ATTACH TO SPRUNG STRUCTURE FRAMING.

9.707 FURNISH AND INSTALL NEW 1/2" CONDUIT TO NEW EXTENSION BOX AT EXISTING CAMERA LOCATION ON SOUTH WALL. RUN NEW CABLE AND RE-TERMINATE AT SAME LOCATION AS PREVIOUS CAMERA.

9.708 RUN CABLE TO FLOOR BOX AT SCREENING MACHINE.

9.709 MOUNT IN FLOOR BOX. REFERENCE E-401 AND ELECTRICAL SPECIFICATIONS FOR MORE INFORMATION.

9.710 PROVIDE AND INSTALL FLOOR BOX INTERFACE FOR CONNECTION TO NEW SURFACE MOUNT RACEWAY.

9.711 PROVIDE AND INSTALL NEW SURFACE MOUNT RACEWAY. EXTEND TO NEW MEDIA BOX FOR FUTURE FIBER OPTIC CABLE.

9.801 MOUNT ON UNDERSIDE OF CANOPY. RUN NEW 3/4" CONDUIT ON UNDERSIDE OF CANOPY. TO MEDIA BOX IN SPRUNG STRUCTURE.

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FIRST FLOOR COMMUNICATIONS PLAN

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T-101

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SECURITY GENERAL NOTES

1. REFER TO T-001 FOR NOTES, SYMBOLS, AND ABBREVIATIONS.
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4. USE HARDWARE SUITABLE FOR ENVIRONMENT AND AS RECOMMENDED BY SPRUNG STRUCTURE MANUFACTURER.

KEYED NOTES

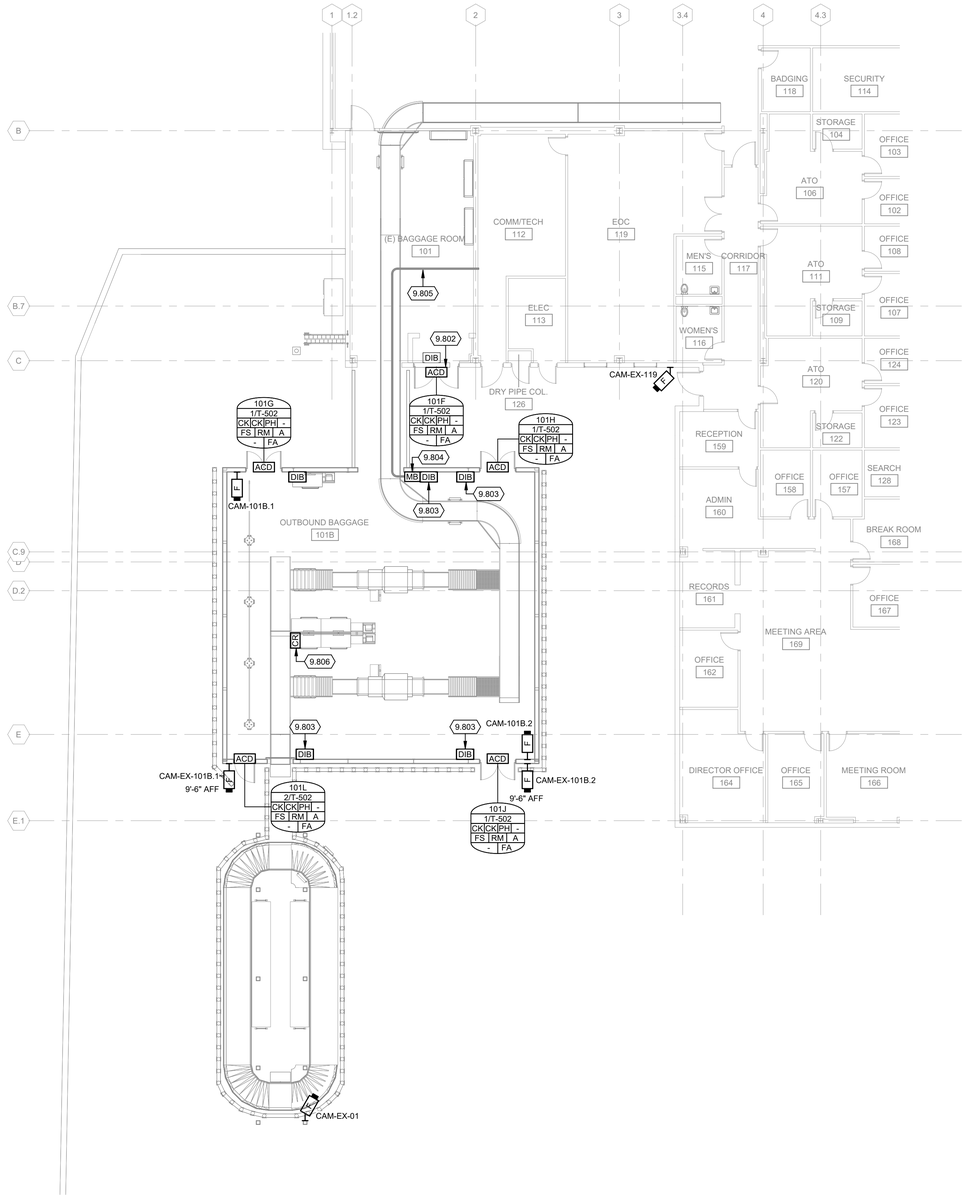
9.802 INSTALL AND CONNECT SALVAGED CARD READER/ KEYPADS TO EXISTING DIB ABOVE DOOR.

9.803 MOUNT TO SPRUNG STRUCTURE FRAMING. PROVIDE AND INSTALL NEW 1" CONDUIT TO NEW MEDIA BOX WITH ACCESS CONTROL CABLING.

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9.805 PROVIDE AND INSTALL NEW 2" CONDUIT ON ELECTRICAL TRAPEZE (SEE E-401) WITH ACCESS CONTROL CABLING TO ACCESS CONTROL PANEL IN COMM/TECH RM. COORDINATE WITH CLIENT FOR EXACT LOCATION.

9.806 PROVIDE AND INSTALL NEW CABLE PATHWAY DOWN INTO UNDER FLOOR RACEWAY SYSTEM. REFERENCE E-401 FOR MORE INFORMATION. RUN NEW CABLING IN UNDERGROUND RACEWAY TO NEW "DIB" LOCATED NEXT TO NEW MEDIA BOX.



N 1 **FIRST FLOOR SECURITY PLAN**
3/32" = 1'-0"

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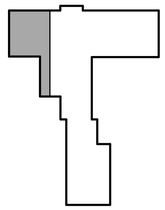
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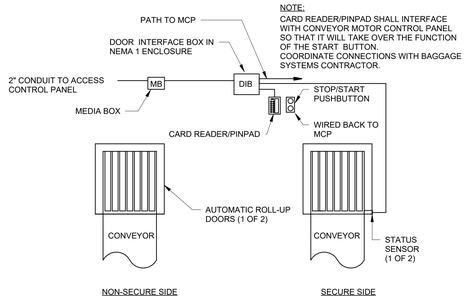
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FIRST FLOOR SECURITY PLAN

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T-121

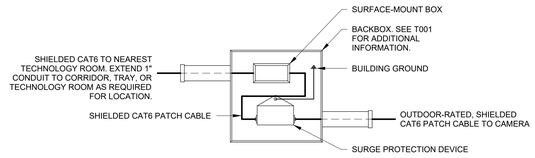
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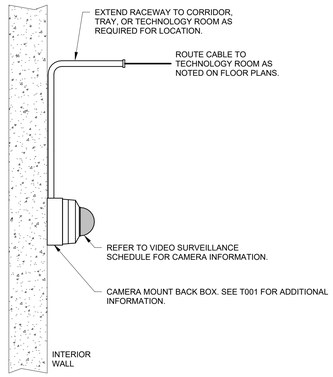


NOTE:
CARD READER/PINPAD SHALL INTERFACE WITH CONVEYOR MOTOR CONTROL PANEL SO THAT IT WILL TAKE OVER THE FUNCTION OF THE START BUTTON. COORDINATE CONNECTIONS WITH BAGGAGE SYSTEMS CONTRACTOR.

4 BAGGAGE HANDLING SYSTEM (BHS) AND ACCESS CONTROL DIAGRAM (TYPICAL)
NO SCALE

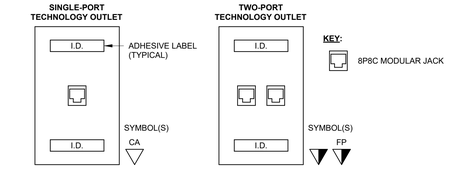


1 EXTERIOR CAMERA - CAMERA OUTLET TERMINATION BOX
NO SCALE



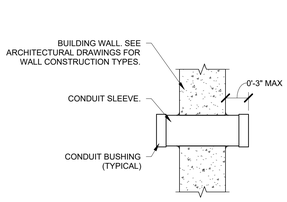
NOTES:
1. REFER TO VIDEO SURVEILLANCE SCHEDULE FOR MOUNTING INFORMATION.
2. REFER TO VIDEO SURVEILLANCE RISER DIAGRAM FOR ADDITIONAL INFORMATION.
3. REFER TO DIVISION 26 SPECIFICATIONS FOR BACKBOX AND CONDUIT TYPE AND SUPPORT REQUIREMENTS.

5 INTERIOR CAMERA - WALL - SURFACE
NO SCALE



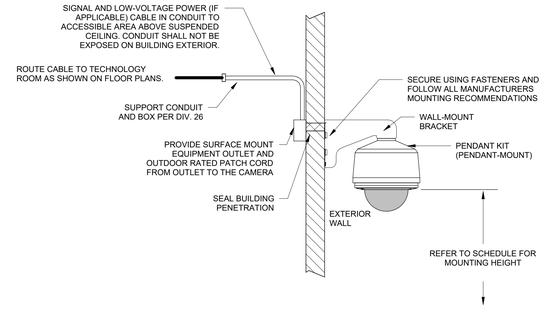
NOTES:
1. REFER TO DIVISION 27 SPECIFICATIONS FOR PERFORMANCE, PIN/PAIR ASSIGNMENTS, MATERIAL, AND COLOR.

2 TECHNOLOGY OUTLET CONFIGURATIONS
NO SCALE



NOTES:
1. MINIMUM SIZING OF SLEEVE(S) FOR BACKBONE OR HORIZONTAL CABLING SHALL RESULT IN A MAXIMUM OF 40% FILL (CABLE AREA / SLEEVE AREA).
2. HORIZONTAL AND BACKBONE CABLES SHALL NOT SHARE THE SAME SLEEVE.
3. REFER TO DIVISION 7 SPECIFICATIONS FOR SLEEVE SEALANT REQUIREMENTS.

6 WALL PENETRATION SLEEVE
NO SCALE



3 CAMERA DOME - EXTERIOR WALL
NO SCALE

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BAGGAGE SCREENING MODS
975 Airport Dr, San Luis Obispo, CA 93401

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1 09/30/25 PERMIT REVISIONS
2 01/28/26 PERMIT REVISIONS

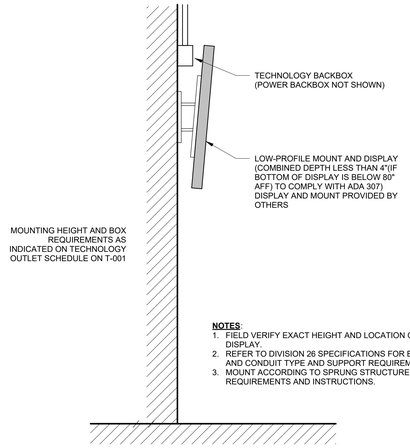
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SHEET CONTENTS
DETAILS

SHEET NO.:
T-501

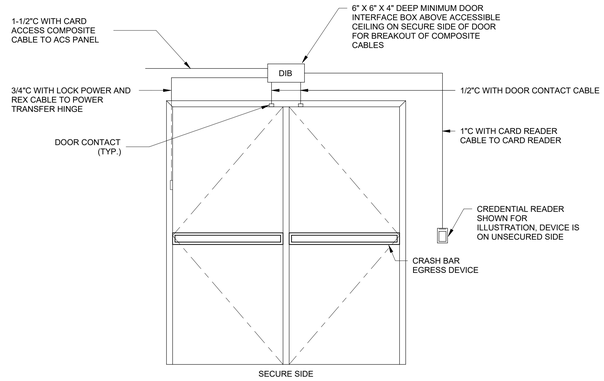
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BICSI ID # 105768
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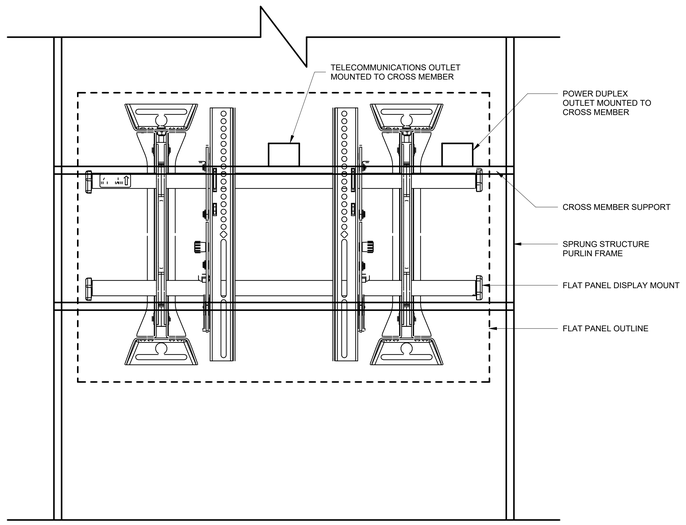
NOTES:
1. FIELD VERIFY EXACT HEIGHT AND LOCATION OF DISPLAY.
2. REFER TO DIVISION 26 SPECIFICATIONS FOR BACKBOX AND CONDUIT TYPE AND SUPPORT REQUIREMENTS.
3. MOUNT ACCORDING TO SPRUNG STRUCTURE REQUIREMENTS AND INSTRUCTIONS.

3 SURFACE WALL-MOUNTED DISPLAY DETAIL
NO SCALE



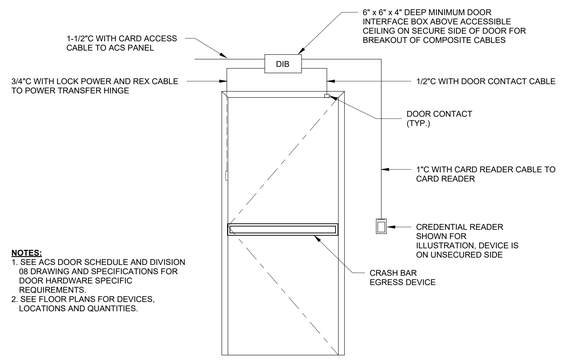
NOTES:
1. SEE ACS DOOR SCHEDULE AND DIVISION 08 DRAWINGS AND SPECIFICATIONS FOR DOOR HARDWARE SPECIFIC REQUIREMENTS.
2. SEE FLOOR PLANS FOR DEVICES, LOCATIONS AND QUANTITIES.

1 ACD - DOUBLE DOOR
NO SCALE



NOTES:
1. FIELD VERIFY EXACT DISTANCE BETWEEN PURLINS.
2. ATTACH CROSS MEMBER SUPPORT PER SPRUNG STRUCTURE MANUFACTURING RECOMMENDATIONS.
3. COORDINATE DISPLAY SIZE WITH SUPPLIER.
4. DISPLAY MOUNT TO BE SIZED ACCORDING TO DISPLAY WEIGHT.
5. REFERENCE DETAIL 3 FOR ADDITIONAL INFORMATION.

4 SURFACE WALL-MOUNTED DISPLAY DETAIL - FRONT VIEW
NO SCALE



NOTES:
1. SEE ACS DOOR SCHEDULE AND DIVISION 08 DRAWING AND SPECIFICATIONS FOR DOOR HARDWARE SPECIFIC REQUIREMENTS.
2. SEE FLOOR PLANS FOR DEVICES, LOCATIONS AND QUANTITIES.

SECURE SIDE

2 ACD - DOUBLE DOOR
NO SCALE

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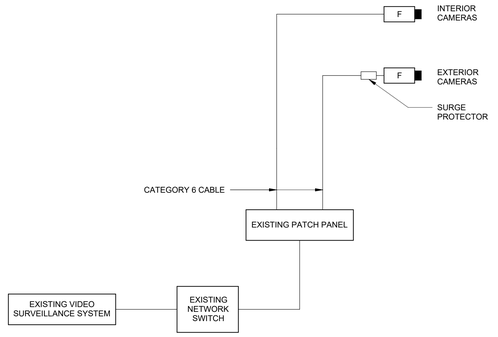
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ACCESS CONTROLLED DOOR SCHEDULE

DOOR ID	LEVEL	NEW/EXISTING	DETAIL	CREDENTIAL READER		LOCKING MECHANISM	REQUEST TO EXIT	DOOR MONITOR	FAIL OPERATION	AUTOMATIC DOOR OPERATOR	LOCAL ALARMS	FIRE ALARM INTERFACE	COMMENTS	ADDITIONAL NOTES
				SIDE 1	SIDE 2									
101F	Level 1	New Construction	1/T-502	CK	CK	PH	-	RM	FS	-	A	FA	PROGRAM FOR DELAYED EGRESS	N/A
101G	Level 1	New Construction	1/T-502	CK	CK	PH	-	RM	FS	-	A	FA	PROGRAM FOR DELAYED EGRESS	N/A
101H	Level 1	New Construction	1/T-502	CK	CK	PH	-	RM	FS	-	A	FA	PROGRAM FOR DELAYED EGRESS	N/A
101J	Level 1	New Construction	1/T-502	CK	CK	PH	-	RM	FS	-	A	FA	PROGRAM FOR DELAYED EGRESS	N/A
101L	Level 1	New Construction	2/T-502	CK	CK	PH	-	RM	FS	-	A	FA	PROGRAM FOR DELAYED EGRESS	N/A

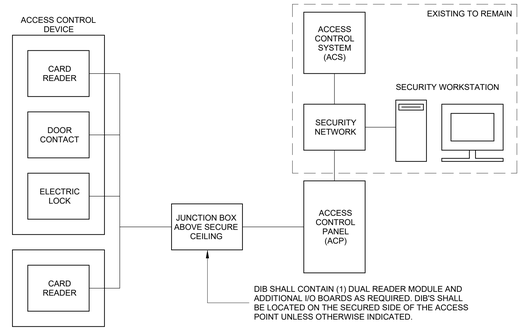
VIDEO SURVEILLANCE SCHEDULE

CAMERA ID	LOCATION	CAMERA CONFIGURATION		AREA OF COVERAGE	MOUNTING CONDITIONS			TERMINATION POINT
		TYPE	SUBTYPE		TYPE	HEIGHT	DETAIL	
CAM-101B.1	NORTHWEST WALL	FIXED	5 MP	DETAILED DESCRIPTION	WALL	9'-0"	7/T-501	COMM/TECH
CAM-101B.2	SOUTHEAST WALL	FIXED	5 MP	DETAILED DESCRIPTION	WALL	9'-0"	7/T-501	COMM/TECH
CAM-EX-01	SOUTHEAST CANOPY	FIXED	5 MP	DETAILED DESCRIPTION	WALL	9'-0"	3/T-501	COMM/TECH
CAM-EX-101B.1	EXTERIOR WEST	FIXED	5 MP	DETAILED DESCRIPTION	WALL	9'-6"	3/T-501	COMM/TECH
CAM-EX-101B.2	EXTERIOR EAST	FIXED	5 MP	DETAILED DESCRIPTION	WALL	9'-6"	3/T-501	COMM/TECH
CAM-EX-119	EXTERIOR WALL OF EXISTING STRUCTURE	FIXED	5 MP	DETAILED DESCRIPTION	WALL	9'-0"	7/T-501	COMM/TECH



NOTES:
1. CAMERAS ARE DIAGRAMMATIC ONLY: REFER TO DRAWINGS FOR ACTUAL QUANTITIES.
2. PROVIDE IN-LINE SURGE PROTECTION FOR ANY EXTERIOR CAMERA.
3. COORDINATE LOCATION OF PATCH PANEL TERMINATION WITH CLIENT.

2 CAMERA ONE-LINE DIAGRAM
NO SCALE



NOTES:
1. REFER TO T-001 FOR NOTES, SYMBOLS AND REFER TO ACCESS CONTROL SCHEDULE FOR ABBREVIATIONS.
2. LAYOUT IS TYPICAL. REFER TO DRAWINGS FOR ACCESS CONTROL LOCATIONS AND QUANTITIES. REFER TO DOOR SCHEDULES AND DIVISION 08 SPECIFICATIONS FOR SPECIFIC DOOR DEVICES.
3. REFER TO DIVISION 28 SPECIFICATIONS FOR ACCESS CONTROL ROLES AND RESPONSIBILITIES. PROVIDE ALL EQUIPMENT AND CONNECTIONS NECESSARY TO PROVIDE A FULLY FUNCTIONAL SYSTEM.
4. NEW DOORS TO BE ADDED TO EXISTING SYSTEM. PROGRAMMING TO BE DONE BY CLIENT.
5. FOLLOW ACCESS CONTROL SYSTEM MANUFACTURER'S REQUIREMENTS FOR INSTALLATION AND CABLING.

1 ACCESS CONTROL ONE-LINE DIAGRAM
NO SCALE

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975 Airport Dr, San Luis Obispo, CA 93401

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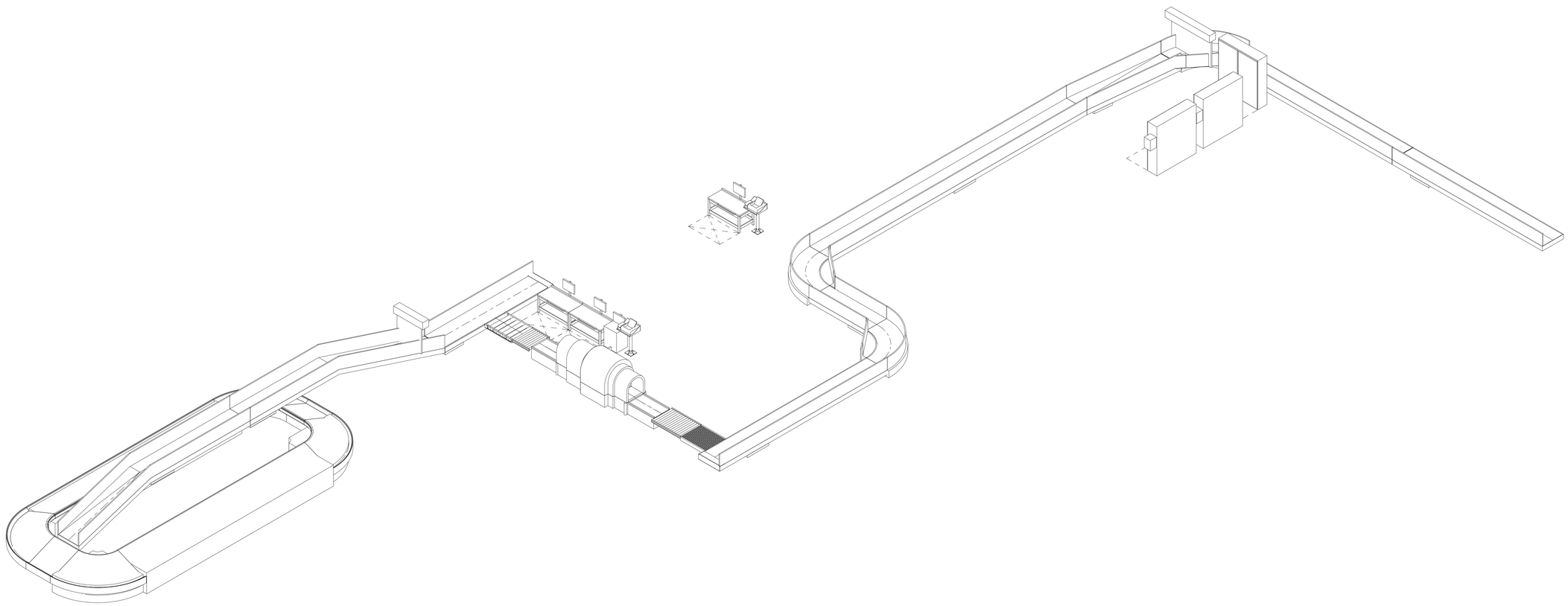
SHEET CONTENTS
SCHEDULES AND ONE-LINE DIAGRAM

SHEET NO.:
T-601

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MICHAEL J SOERING
BICSI ID # 101765
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT
BAGGAGE SCREENING MODIFICATIONS
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401



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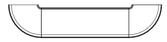
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COVER SHEET

SHEET NO.:
QB-000

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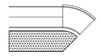
BHS EQUIPMENT LEGEND

DESCRIPTION	PLAN VIEW	ELEVATION
90° POWER TURN		
TRANSPORT CONV.		
INCLINE CONV.		
DECLINE CONV.		
BREAKOVER CONV.		
SECURITY DOOR		
MCP		
INCLINED PLATE MAKE-UP DEVICE		
ROLLER BED		
LIFT GATE		
BALL MAT		
CT-80DR+L		

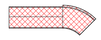
SYMBOLS



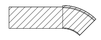
EXISTING CONVEYOR



EXISTING CONVEYOR
W/ EXISTING CATWALK



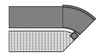
CONVEYOR TO BE DEMOLISHED



CONVEYOR TO BE MODIFIED / RE-USED



PROPOSED CONVEYOR



PROPOSED CONVEYOR
W/ NEW CATWALK

BREAK LINE

FLOW ARROW

ELEVATION MARKER



DRIVE SECTION (PLAN VIEW)



DRIVE SECTION (ELEVATION)



ENDROLLER SECTION (PLAN VIEW)



ENDROLLER SECTION (ELEVATION)

ABBREVIATIONS

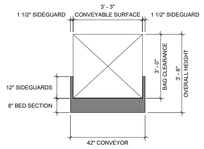
ABBR.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ARCH	ARCHITECT
BM	BALL MAT
BR	BETWEEN FRAME
BHS	BAGGAGE HANDLING SYSTEM
BHSC	BAGGAGE HANDLING SYSTEM CONTRACTOR
BLDG	BUILDING
BOT	BOTTOM
CB	CLEAR BAG
CBRA	CHECKED BAGGAGE RESOLUTION AREA
CENTL	CENTRAL
CL	CENTERLINE
CLR	CLEAR
CONC	CONTINUOUS
CONV	CONVEYOR
DEG	DEGREE
DWG	DRAWING
(E)	EXISTING
ETD	EXPLOSIVE TRACE DETECTION
EL	ELEVATION
E-STOP	EMERGENCY STOP
EQUIP	EQUIPMENT
FIN	FINISH
FL	FLOOR
GC	GENERAL CONTRACTOR
HT	HEIGHT
ID	IDENTIFICATION
INTFC	INTERFACE
ISO	ISOMETRIC
LG	LIFT GATE
LP	LATCH POINT
LVL	LEVEL
MANT	MAINTENANCE
MCP	MOTOR CONTROL PANEL
MIN	MINIMUM
MU	MAKE-UP UNIT
OA	OVERALL
O/C	ON CENTER
OOG	OUT OF GAUGE BAG
OPS	OPERATIONS
OPNG	OPENING
OSA	ON SCREEN RESOLUTION
PAX	PASSENGERS
PLATF	PLATFORM
RB	ROLLERBED
REF	REFERENCE
REQ'D	REQUIRED
SEC	SECONDS
SB	SUSPECT BAG
SM	SIMILAR
SS	STAINLESS STEEL
STR	STRUCTURE
TEMP	TEMPORARY
TOB	TOP OF BELT
TOP	TOP OF PLATFORM
TOS	TOP OF STEEL
TRS	TOP RUNNING SURFACE
TSA	TRANSPORTATION SECURITY ADMINISTRATION
TYP	TYPICAL
VIF	VERIFY IN FIELD

DRAWING SHEET LIST

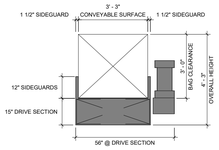
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DRAWING SHEET LIST	
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QB-000	COVER SHEET
QB-001	SYMBOLS & ABBREV PAGE
QB-002	GENERAL NOTES
QB-003	SINGLE LINE DIAGRAM
QB-004	PLAN VIEW - FIRST FLOOR - PROPOSED - SUBSYSTEMS
QB-100	PLAN VIEW - FIRST FLOOR - DEMO
QB-130	PLAN VIEW - FIRST FLOOR - TEMPORARY
QB-150	OVERALL VIEW - FIRST FLOOR - PROPOSED
QB-151	PLAN VIEW - FIRST FLOOR - PROPOSED
QB-200	ENLARGED VIEW - FIRST FLOOR - PROPOSED - CBRA
QB-300	SECTION VIEWS - FIRST FLOOR - PROPOSED - TICKETING
QB-301	SECTION VIEWS - FIRST FLOOR - PROPOSED - CBRA
QB-302	SECTION VIEWS - FIRST FLOOR - PROPOSED - MAKE-UP
QB-303	SECTION VIEWS - FIRST FLOOR - TEMPORARY
QB-450	PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 0
QB-451	PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 1
QB-452	PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 2
QB-500	TYPICAL DETAILS - SAFETY SIGNAGE
QB-501	TYPICAL DETAILS - SAFETY SIGNAGE
QB-502	TYPICAL DETAILS - SECURITY DOOR
QB-503	TYPICAL DETAILS - MCP CABINET
QB-504	TYPICAL DETAILS - INCLINE PLATE - MAKE-UP
QB-505	TYPICAL DETAILS - LOADING DETAILS
QB-506	TYPICAL DETAILS - OVERSIZE SIDEGUARD MODIFICATION
QB-507	TYPICAL DETAILS - FLOOR SUPPORT ANCHORS
QB-600	CONVEYOR MANIFEST
QB-650	PLAN VIEW - FIRST FLOOR - PROPOSED - MCP ZONES & MCP LOADS
QB-700	TYPICAL DETAILS - CONTROL STATIONS
QB-701	PLAN VIEW - FIRST FLOOR - PROPOSED - CONTROL STATION LAYOUT
QB-750	PLAN VIEW - FIRST FLOOR - PROPOSED - E-STOP ZONES
QB-800	PLAN VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWALKS
QB-801	SECTION VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWALKS

TYPICAL CONVEYOR CLEARANCES



TYPICAL CONVEYOR ROW



TYPICAL CONVEYOR ROW
@ DRIVE SECTION

CONVEYOR I.D. NOMENCLATURE

XXX - ##

CONVEYOR SUBSYSTEM ID

TC1 - TICKET COUNTER #1
SS1 - SECURITY SHUNT #1
SS2 - SECURITY SHUNT #2
MF- MAKE-UP FEED

CONVEYOR SEQUENCE NUMBER

BEGINS WITH 01
CONTINUES CONSECUTIVELY THROUGH DURATION OF SUBSYSTEM

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975 AIRPORT DRIVE, SUITE 1
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SHEET CONTENTS
SYMBOLS & ABBREV PAGE

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GENERAL NOTES

Introduction

1. This introduction to the drawing package and the contract documents is intended to allow the Contractor to gain a quick understanding of the details that are contained herein – it is not however a substitution for the required detailed work in order to develop a proper proposal.
2. This drawing package and the associated contract documents make up the scope of work at the Airport
3. It is the Contractor's responsibility to carefully review the information contained herein to understand the intent of the systems presented. Furthermore, the Contractor assumes full responsibility to deliver a fully functioning system once completed.
4. The information presented is not guaranteed to be 100% accurate. However, it is the best known information at the time of the preparation of the contract documents.
5. The Contractor is to review and understand the program before developing a proposal.

General Notes

1. The purpose of the drawings and specifications is to communicate the general design intent.
2. Pricing submitted shall be for a complete and operational system. All systems shall include all components required to make it so, whether shown on the drawings or specifications or not. Any additional drawings, specifications, or additional clarifications shall be presented to the owner and/or the Project Manager during the review process.
3. The Contractor shall visit the jobsite to verify dimensions governing the work to be completed. All dimensions, measurements, locations, elevations, etc., shall be taken from the actual field conditions – all of which the Contractor shall assume responsibility for.
4. It is the Contractor's responsibility to examine all obstructions adjoining the baggage system and report any conflict(s) which must be corrected to the Project Manager.
5. All work shall comply with applicable federal, state, and local codes, laws, acts, ordinances, and all authorities having jurisdiction.
6. Connections to existing systems shall be made so that the use of these systems is not interrupted without the Project Manager's approval as to the time and duration.
7. The Contractor shall prepare operation and maintenance manuals for all delivered systems prior to the system operational in use date (see technical specification 347716).
8. The Contractor shall be responsible for all aspects of jobsite safety. The Project Manager shall not assume any responsibility or risk for means and methods used by the Contractor for performing the work.

Drawings

1. The contract documents include (but are not limited to) the baggage system drawings, architectural drawings, communications/network drawings, electrical drawings, project specifications and apply to the work of this section. The Contractor is to familiarize themselves with all contract documents and how they relate to the installation and operation of the baggage handling system.
2. It shall be the Contractor's responsibility to request and obtain all necessary drawings and specifications applicable to the work from the Project Manager.

Existing Conditions

1. Information regarding existing conveyor equipment designated to remain, to be modified, or to be removed shall be obtained from the Project Manager (e.g. electrical as-build drawings, O&M manuals, and PLC architecture).
2. The BHS specification and accompanying contract documents are intended to outline the work and define functional requirements and establish minimum standards of quality for the project.
3. The Contractor shall assume full responsibility that the BHS; when completed the Work shall meet all local, state and federal laws, codes and safety standards and assures a safe and efficient system for all personnel who operate it, maintain it or have access to it.

Scope of Work

1. Provide a complete, operable, maintainable and safe system on a "turn-key basis", including all supports, header steel (unless otherwise specified),hangers, anchors, framing, trim, electrical power runs, motors, motor starters, disconnects, controls, software, push buttons, conduit, wiring, cabinets, platforms, ladders, stairs, crossovers, impact protection, etc., whether specifically shown and described, or implied in the plans and specifications or wherever required to effectively accomplish the intended functions of the BHS.
2. Furnish all design, labor, materials, and equipment required for implementing the BHS as defined by these contractdocuments. This includes, but is not limited to, installation, testing, installation of interim BHS conveyor segments (if applicable), all necessary wiring between BHS components, necessary protection of conveyor equipment with all related components, provisions of PLC's and PLC networks.
3. Furnish implementation schedules and/or associated phasing plan documentation with the operating and maintenance documentation to the Project Manager including required manuals, equipment parts lists and shop drawings; all in strict accordance with the specifications and applicable contract documents and subject to the terms and conditions of the contract.
4. Provide all hardware, software and construction supervision to insure that the BHS equipment operates as per the contract documents.
5. Comply with the TSA planning guidelines listed in the contract documents in all areas unless specific exceptions have been granted at time of award.

Execution

Demolition

1. Prior to the addition of any new equipment, currently installed items highlighted on drawings should be removed from service. Their removal should also result in the removal of all associated structural supports, hangers, electrical control devices, wiring, impact protection, etc. Related to that equipment per all applicable federal, state, local codes, and laws unless otherwise noted. Removal of this equipment must conform to the construction phasing plan defined in this documentation.
2. In the layout of the work the Contractor will encounter miscellaneous railings, ladders, stairs, crossovers, conduits, fire sprinklers, and other objects that are to be removed, relocated, or made safe. The Contractor will include this work in their proposal.

Removal / Recycling Salvage

1. GENERAL

A. The Contractor shall wherever possible make every effort to recycle in an environmentally friendly manner.
B. Care shall be taken by the Contractor when removing equipment to ensure that any equipment available for recovery by the Airport and used in the existing BHS remains in good condition and can be salvaged. In addition, any equipment that could be recycled shall not be contaminated such that it cannot be recycled.

2. DISPOSAL

A. All equipment not available for recycling shall be properly disposed of by the Contractor.
B. All gearboxes shall have fluids removed and properly disposed of before recycling.

3. CITY RECOVERY

A. The Contractor shall provide the City with five (5) days prior notice of existing equipment becoming available for recovery by the Airport's O&M contractor. The Airport shall be given five (5) days in which to remove any components from decommissioned equipment. Following removal of equipment by the Airport, the Contractor shall dispose of such equipment in accordance with the removal/recycling requirements of this contract.
B. Assemblies for recovery by the O&M contractors shall include components from;
   a. Power turns
   b. Merges
   c. HSD's
   d. Drive/head/tail units
   e. Motors
   f. Gearboxes/reducers
   g. Conveyor belting
   h. PEC's
   i. Encoders
   j. Warning devices
   k. Internal MCP equipment for MCP's not being reused by the Contractor
   l. VFD's

Installation

1. All equipment installation will include all associated structural supports, hangers, electrical control devices, wiring, etc. related to that equipment.

Modification

1. Modify all highlighted conveyors using the detailed equipment schedules. Reference the new/modified column for conveyor status and associated work required.

General Construction Provisions

1. All dimensions on structural drawings shall be field verified and checked against the architectural drawings. Any discrepancies shall be reported to the Project Manager. In case of conflicts between notes, details, plans and specifications the most rigid requirements shall govern until such time as a clarification is issued.
2. Project Manager's approval must be secured for all substitutions, prior to submission of bids.
3. The Contractor shall refer to architectural, mechanical, plumbing, electrical, and any other specialty drawings for size and location of openings, sleeves, curbs, inserts, slopes, depressions, or other items that interfere with the structure.
4. The requirements of the latest edition of the "OSHA construction standards" shall be followed by all Contractors, fabricators, and suppliers.
5. Conveyors shall be installed and operated in accordance with CAL OSHA General Industry Safety Order and Title 8 Section 3999.
6. The Contractor shall notify Project Manager of any obviously damaged structure not noted on the drawings prior to proceeding with related or affected construction. Likewise, the Contractor shall notify the Project Manager of any discrepancies between the assumed existing structure shown on the drawings and that found in the field.

2

Construction Site

1. Any reproduction of BHS bid drawings for re-submittal as shop drawings or bidding drawings is prohibited. Drawings produced in such a manner will be rejected.
2. All work for the construction and installation of the BHS shall be in accordance with all codes and standards and local laws and regulations, applicable to the design and construction of this type of equipment, which are generally accepted and used as good practice throughout the industry, namely NFPA, Underwriter's Laboratories, OSHA, SAE publications, National Electrical Code (NEC), American National Standards, etc. Design all parts and sub-assemblies in accordance with good commercial practice and assure safe, efficient and practical design in keeping with requirements peculiar to this type of system.
3. The Contractor shall be responsible for submittal to the Project Manager any request for information, clarification of specification and variance from the specifications as a request of information (RFI).
4. The Contractor shall obtain and pay for all permits, inspection fees and certificates relative to all phases of BHS construction.
5. The Contractor shall be responsible for all employee badges as required by the airport authority for this project. The owner will not provide escort services for employees.
6. The Contractor shall provide any and all temporary power and lighting that may be required for and during the course of installation and testing of the BHS. All temporary power and lighting must be approved by the Project Manager.
7. The Contractor shall perform a complete mechanical and electrical field survey of the existing BHS equipment and maintain consistency with the existing conveyor components in term of motors, gearboxes, bearing, belting, field control components and MCP control components to reduce spare parts inventory.
8. All temporary and final conveyor equipment supports shall be designed, engineered and installed so as not to infringe on the airport and the owner's operational areas, drive aisles or cart staging areas. All BHS equipment supports and installations in part or whole must not interfere with the row of any existing or future equipment designated for installation. All BHS installations shall maximize future baggage right of ways.
9. After installation of the BHS, the Contractor shall demonstrate the system 's operating capabilities to the Project Manager and/or his representative. Prior to the start of system acceptance testing, the BHS Contractor shall have accomplished all of the Contractor's internal testing.
10. The Contractor shall coordinate with airport security prior to start of work that could be potentially compromising to the airport's security (e.g. wall breakthroughs from ticketing).

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BAGGAGE SCREENING MODS.
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

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2	01/28/26	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: LP
DRAWN BY: LP
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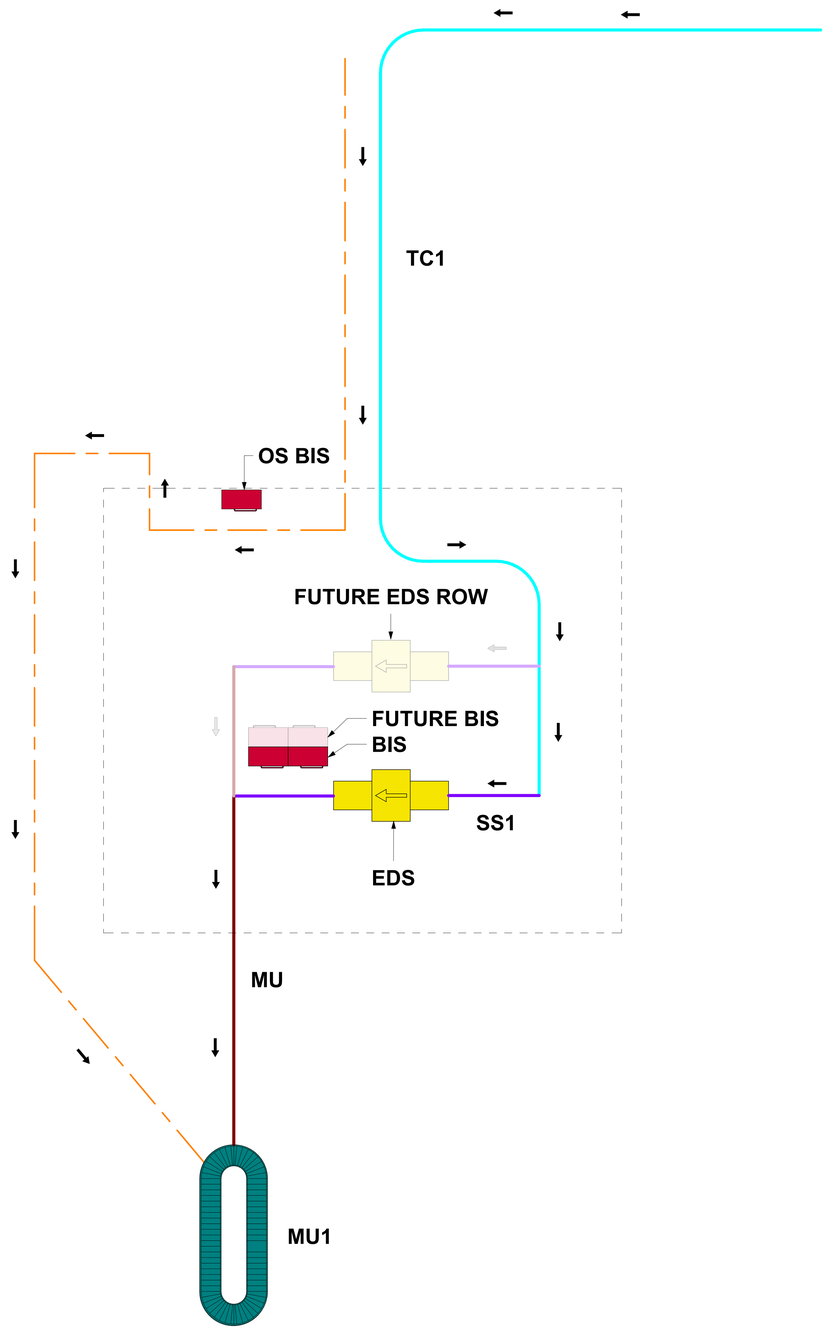
SHEET CONTENTS
GENERAL NOTES

SHEET NO.:
QB-002

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NOTES:

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BHS LEGEND - SUBSYSTEM(SLD)

- TICKETING LINE
- MAKE-UP FEED
- MAKE-UP
- SECURITY SHUNT
- FUTURE LINE
- OS PATH

BHS LEGEND - SINGLE LINE DIAGRAM

- INCLINE PLATE MAKE UP/CLAIM
- BAG INSPECTION STATION (BIS)
- EDS MACHINE
- FLOW ARROW

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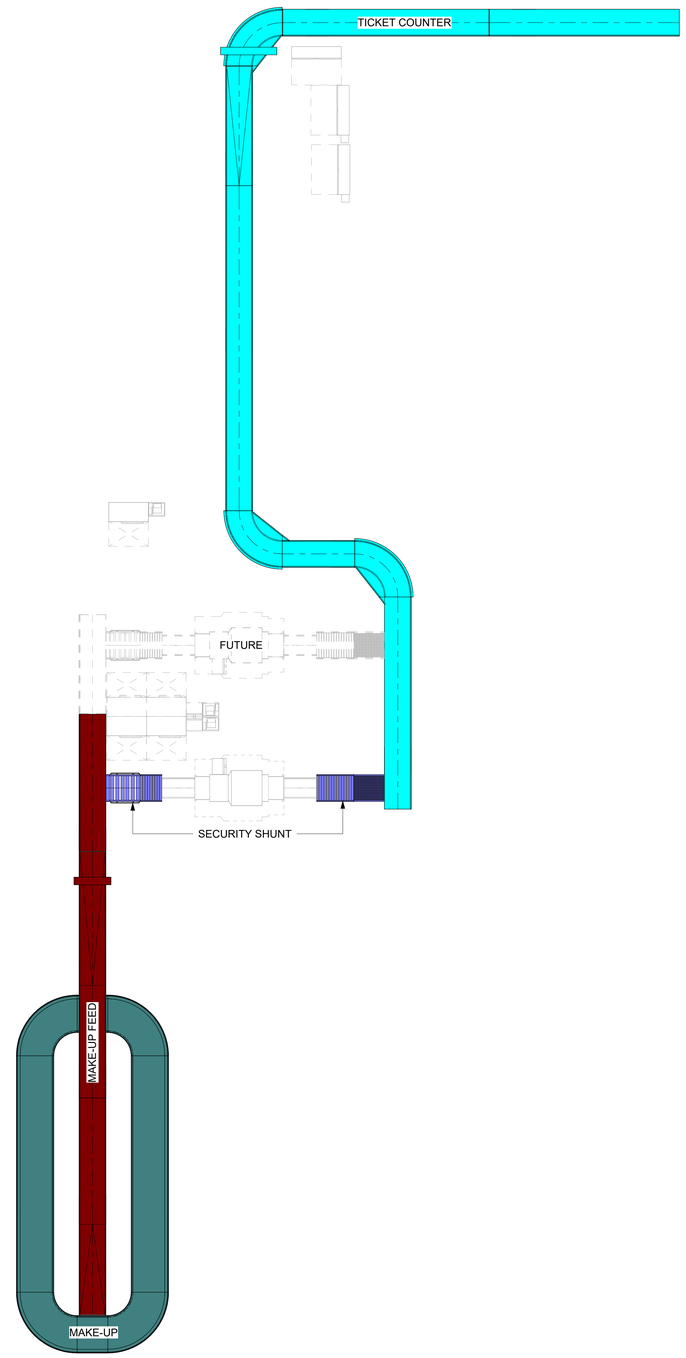
SHEET CONTENTS
SINGLE LINE DIAGRAM

SHEET NO.:
QB-003

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1 PLAN VIEW - FIRST FLOOR - PROPOSED - SUBSYSTEMS
1/8" = 1'-0"

BHS LEGEND - SUBSYSTEMS

- TICKETING COUNTER
- MAKE-UP FEED
- MAKE-UP
- SECURITY SHUNT
- FUTURE LINE

8 4 0 8 16

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SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - SUBSYSTEMS

SHEET NO.:
QB-004

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1 PLAN VIEW - FIRST FLOOR - DEMO
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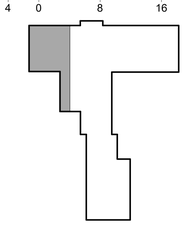
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BHS LEGEND - DEMO

- DEMO
- EXISTING TO REMAIN
- RELOCATE

8 4 0 8 16



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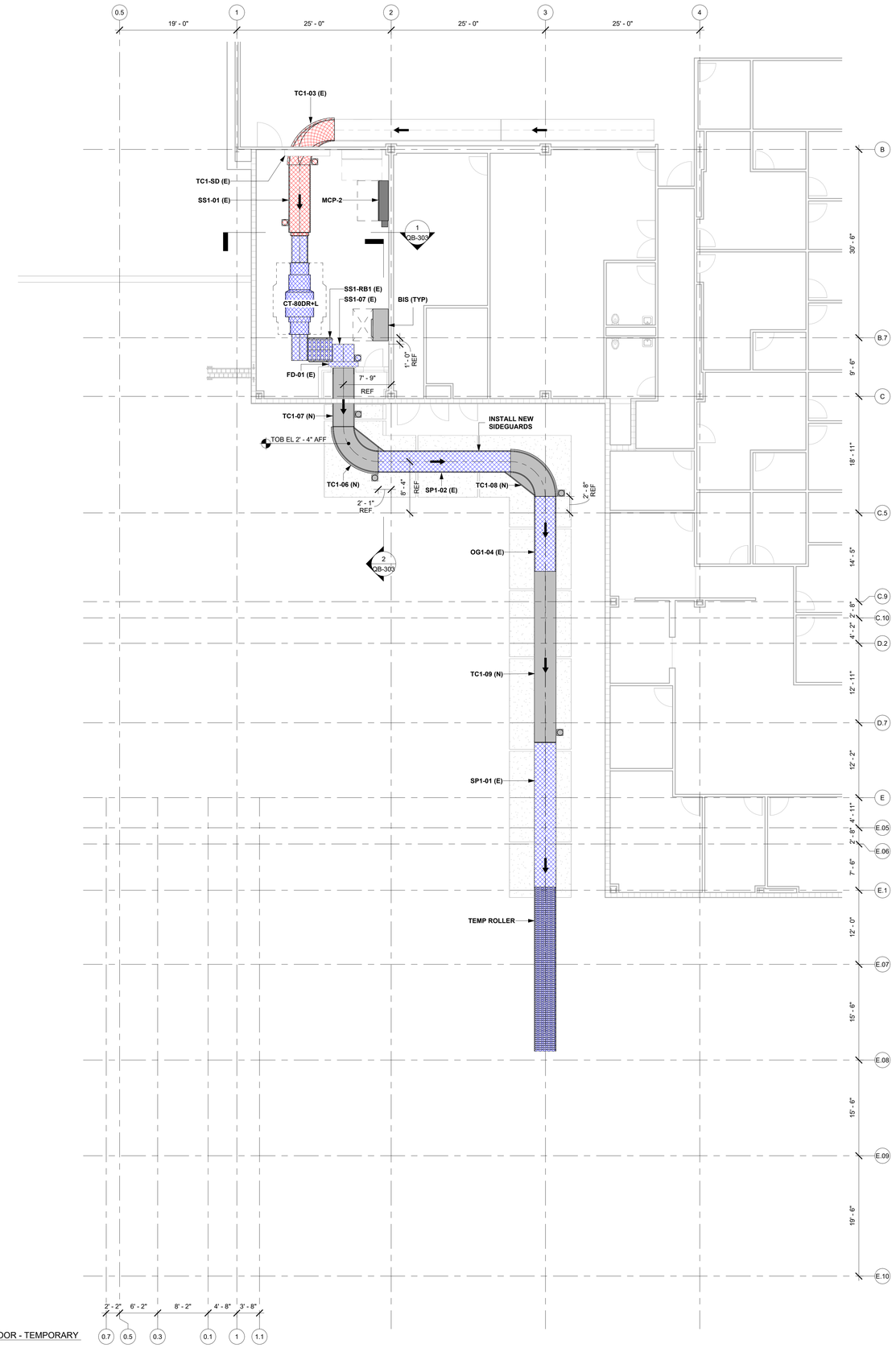
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SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - DEMO

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QB-100

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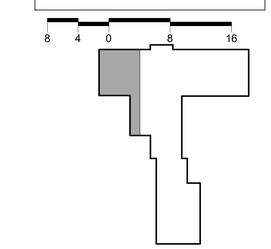
1 PLAN VIEW - FIRST FLOOR - TEMPORARY
1/8" = 1'-0"

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BHS LEGEND - TEMPORARY

- PROPOSED - TEMPORARY USED IN FINAL CONFIGURATION
- EXISTING CONVEYORS USED IN TEMPORARY
- EXISTING CONVEYORS TO DEMO AFTER TEMPORARY
- EXISTING TO REMAIN



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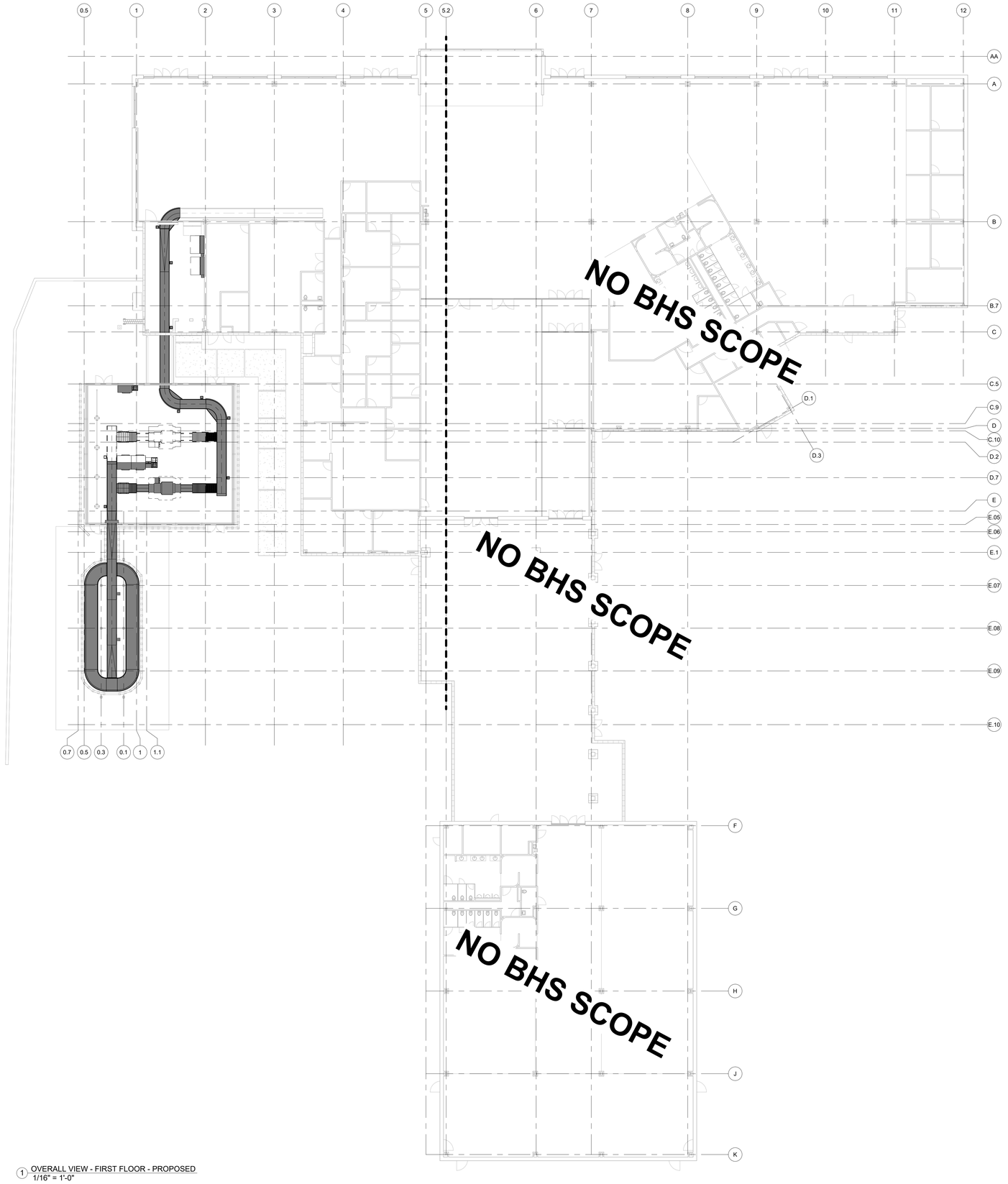
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SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - TEMPORARY

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QB-130

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1 OVERALL VIEW - FIRST FLOOR - PROPOSED
1/16" = 1'-0"

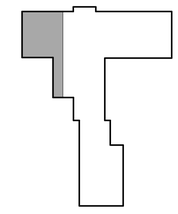
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BHS LEGEND - PROPOSED

- PROPOSED
- EXISTING TO REMAIN
- FUTURE

16 8 0 16 32



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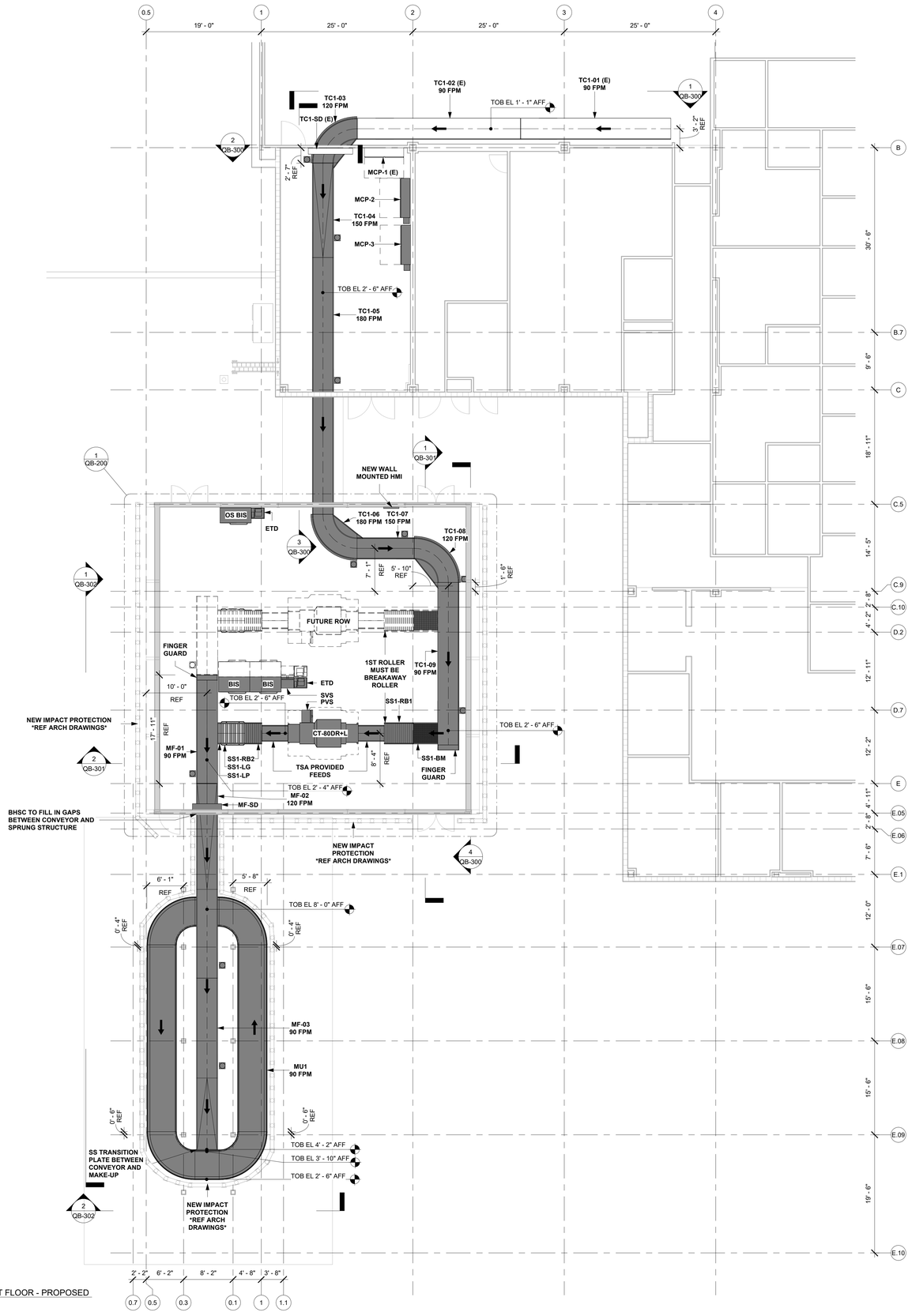
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SHEET CONTENTS
OVERALL VIEW - FIRST FLOOR - PROPOSED

SHEET NO.:

QB-150

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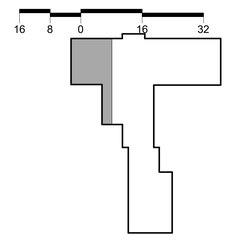
1 PLAN VIEW - FIRST FLOOR - PROPOSED
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BHS LEGEND - PROPOSED

- PROPOSED
- EXISTING TO REMAIN
- FUTURE



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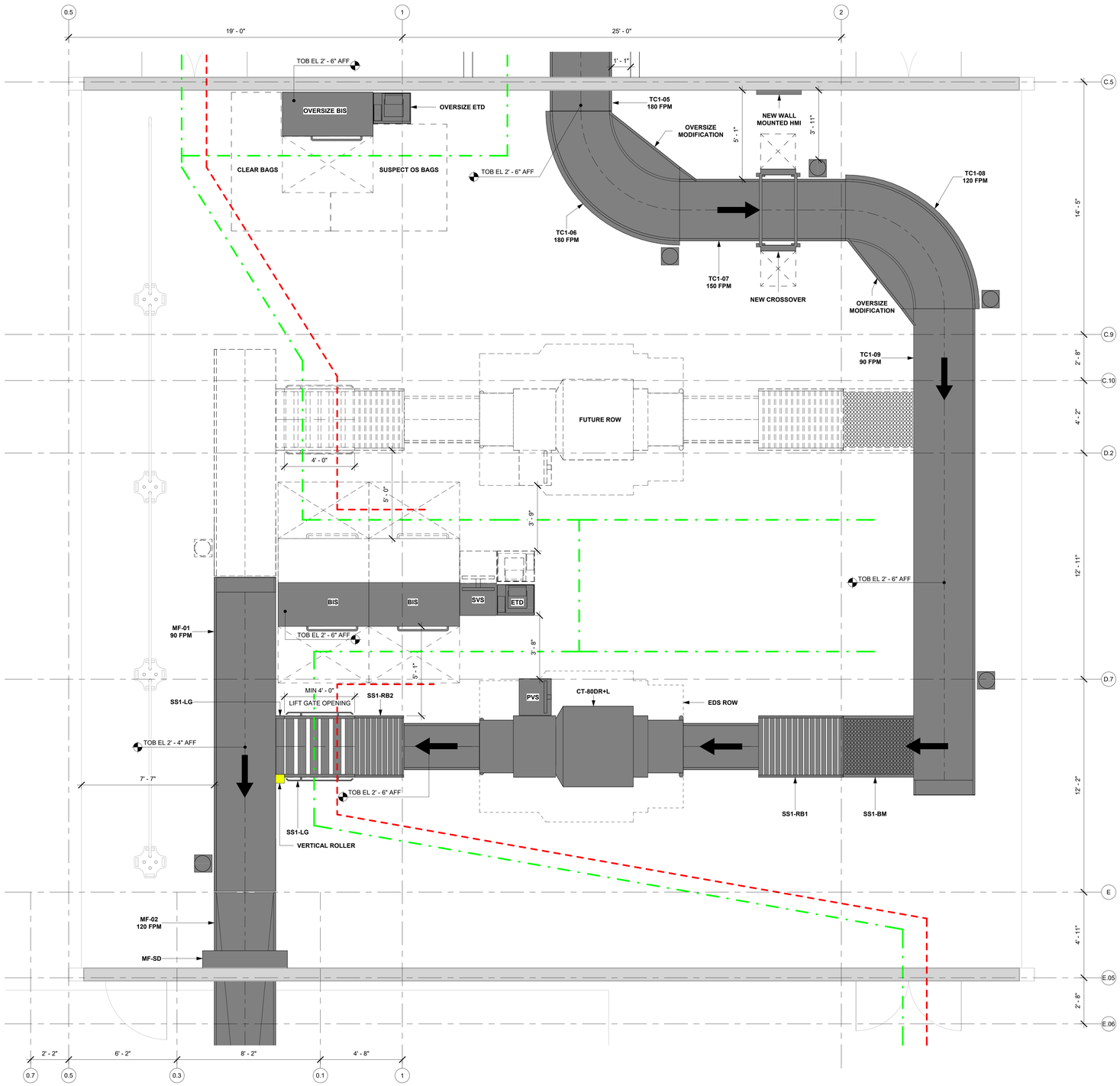
SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED

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QB-151

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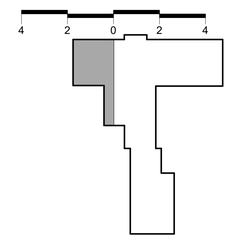
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1 PLAN VIEW - FIRST FLOOR - PROPOSED - CBRA
3/8" = 1'-0"

BHS LEGEND - TSA EGRESS

- EOD ROBOT PATH
- EGRESS/INGRESS PATH



KEY PLAN

Mead & Hunt

Mead & Hunt, Inc.
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phone: 503-548-1494
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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED
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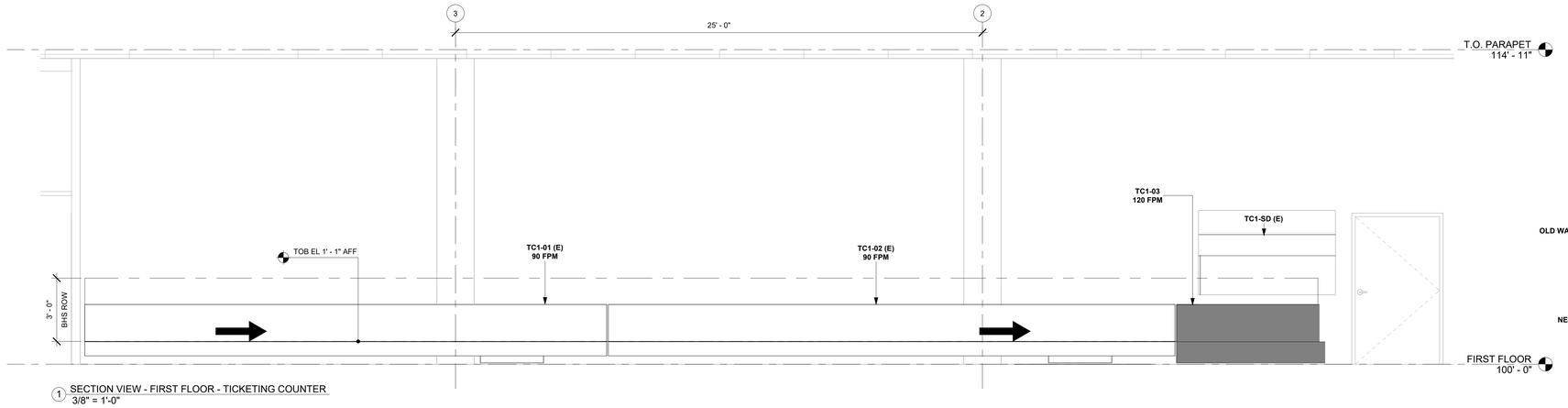
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SHEET CONTENTS
ENLARGED VIEW - FIRST FLOOR - PROPOSED - CBRA

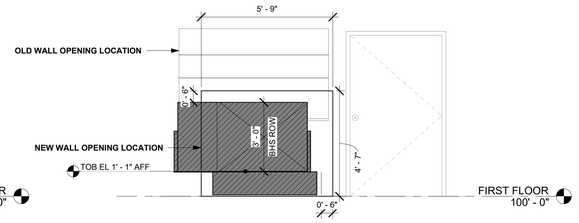
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QB-200

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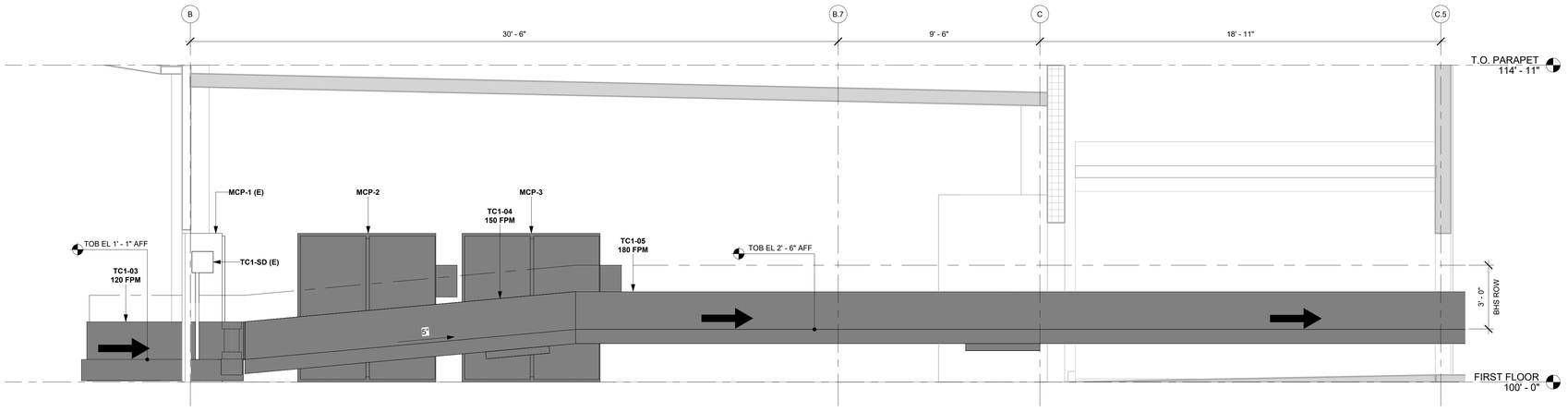
NOTES:
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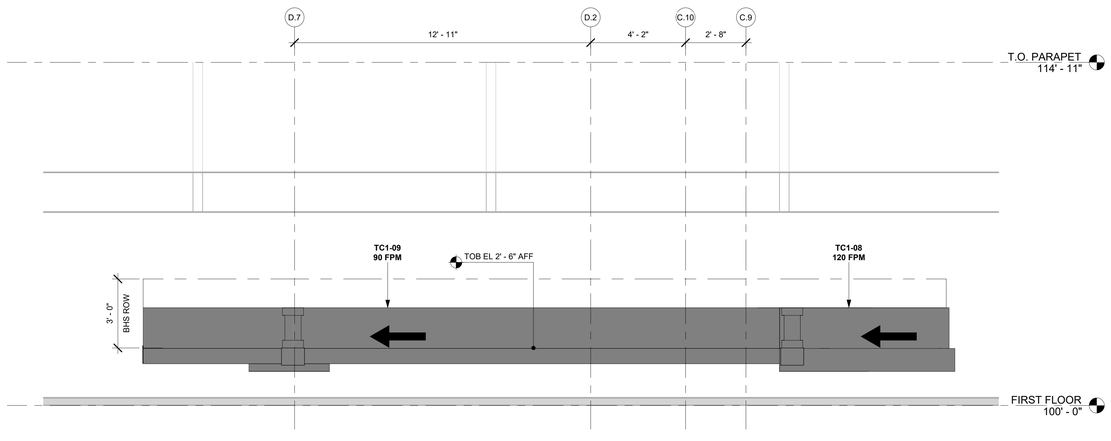
1 SECTION VIEW - FIRST FLOOR - TICKETING COUNTER
3/8" = 1'-0"



2 SECTION VIEW - FIRST FLOOR - PROPOSED - TICKET COUNTER OPENING
3/8" = 1'-0"



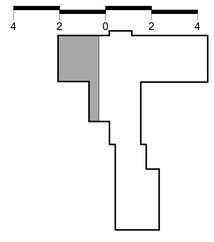
3 SECTION VIEW - FIRST FLOOR - TICKETING FEED
3/8" = 1'-0"



4 SECTION VIEW - FIRST FLOOR - SECURITY LINE
3/8" = 1'-0"

BHS LEGEND - PROPOSED

	PROPOSED
	EXISTING TO REMAIN
	FUTURE



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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
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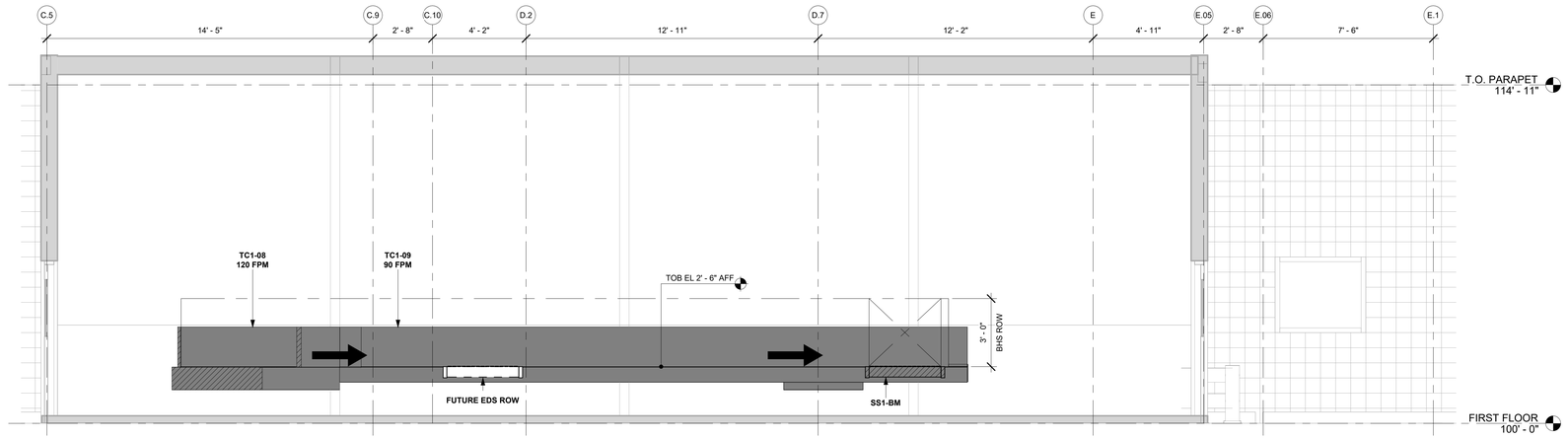
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SECTION VIEWS - FIRST FLOOR - PROPOSED - TICKETING

SHEET NO.:
QB-300

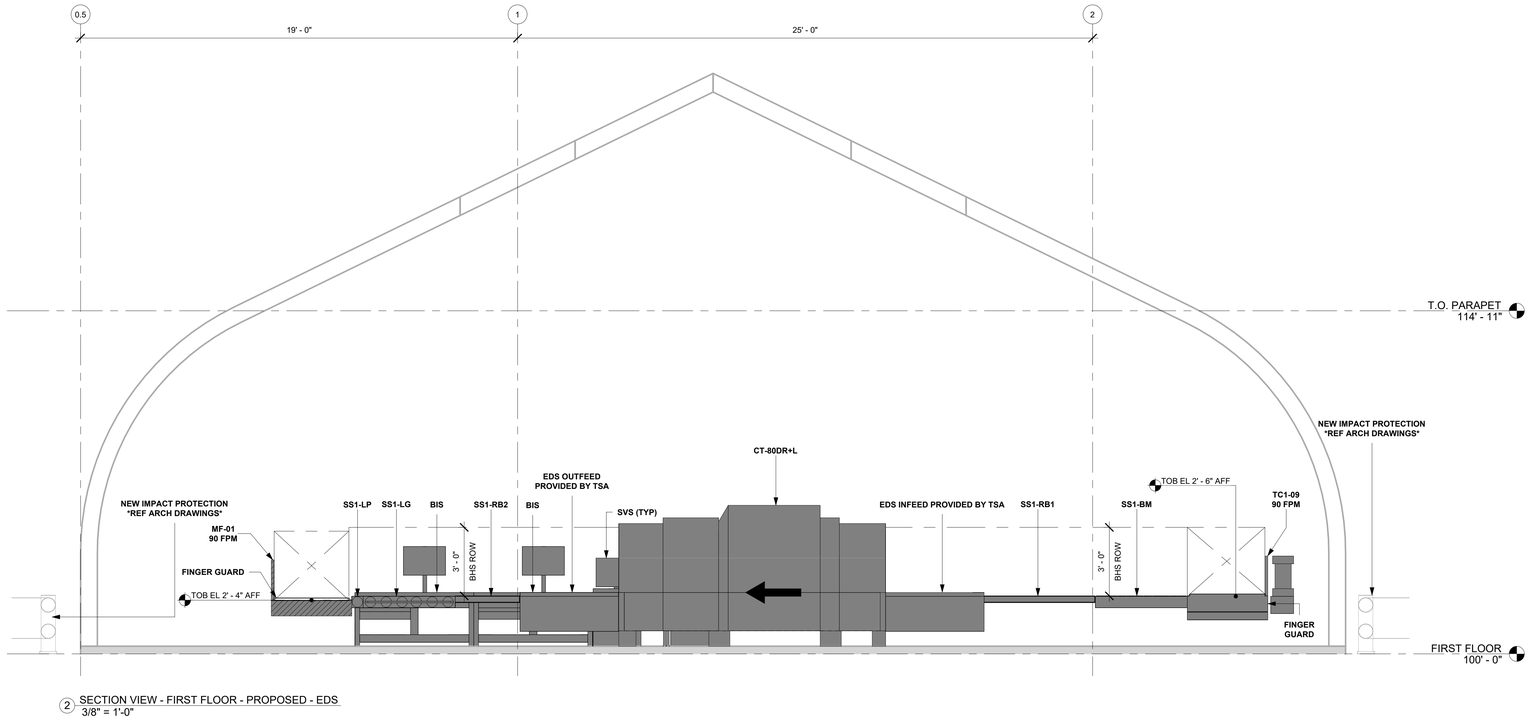
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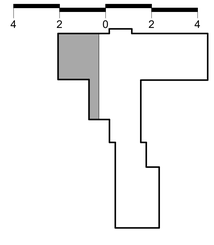
1 SECTION VIEW - FIRST FLOOR - TICKET COUNTER EDS FEED
3/8" = 1'-0"



2 SECTION VIEW - FIRST FLOOR - PROPOSED - EDS
3/8" = 1'-0"

BHS LEGEND - PROPOSED

- PROPOSED
- EXISTING TO REMAIN
- FUTURE



KEY PLAN

Mead & Hunt

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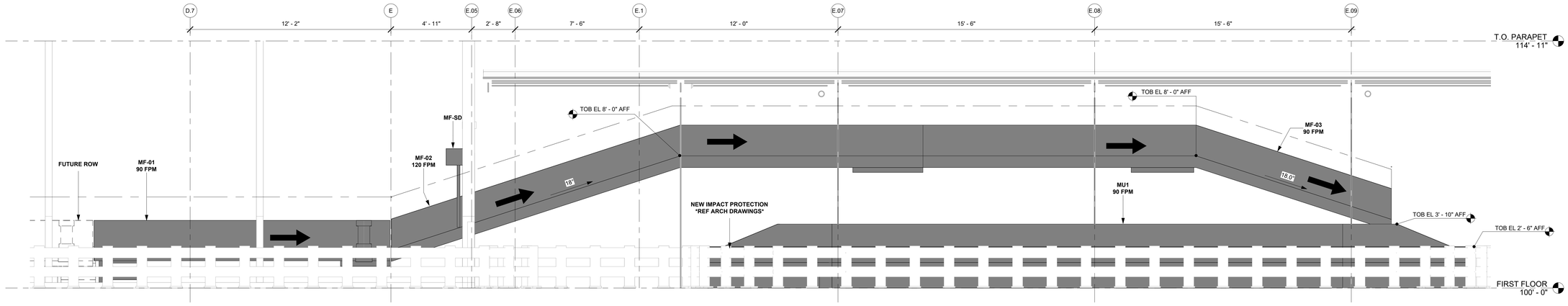
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SECTION VIEWS - FIRST FLOOR - PROPOSED - CBRA

SHEET NO.:

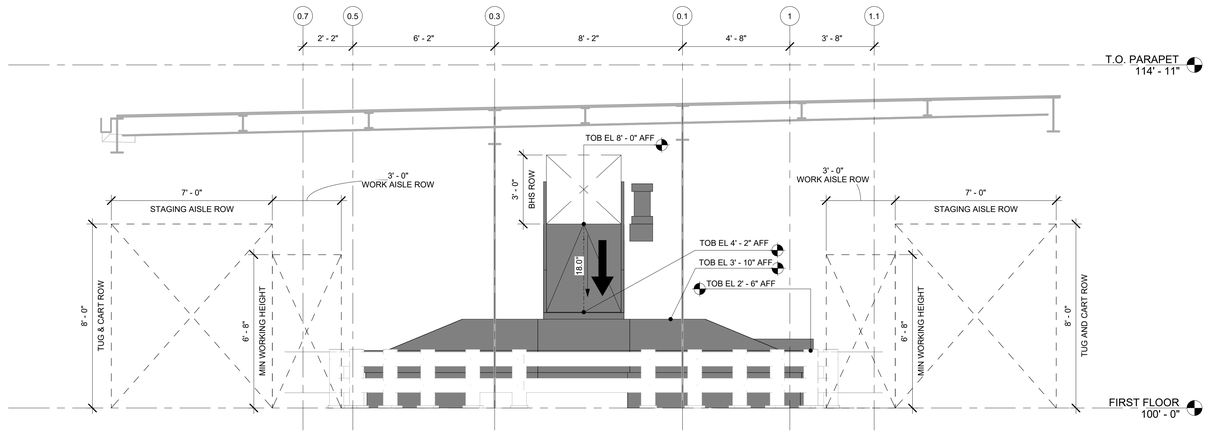
QB-301

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1 SECTION VIEW - FIRST FLOOR - PROPOSED - MAKE-UP FEED
3/8" = 1'-0"



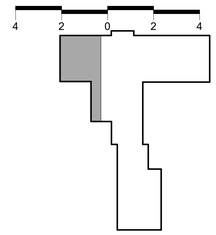
2 SECTION VIEW - FIRST FLOOR - PROPOSED - MAKE-UP CROSS SECTION
3/8" = 1'-0"

BHS LEGEND - PROPOSED

PROPOSED

EXISTING TO REMAIN

FUTURE



KEY PLAN

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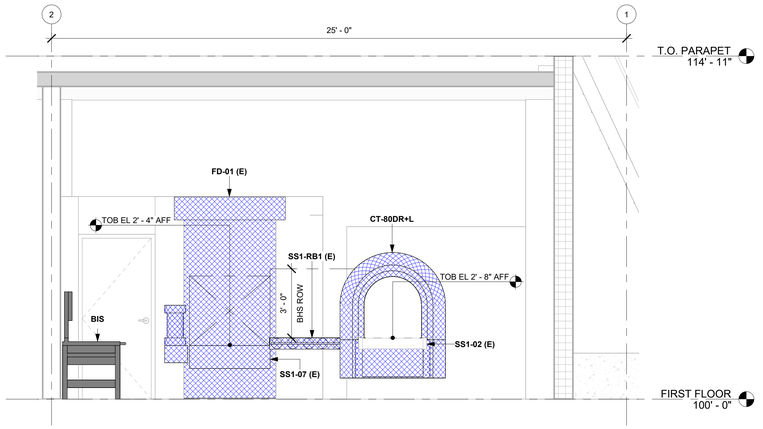
SHEET CONTENTS
SECTION VIEWS - FIRST FLOOR - PROPOSED - MAKE-UP

SHEET NO.:
QB-302

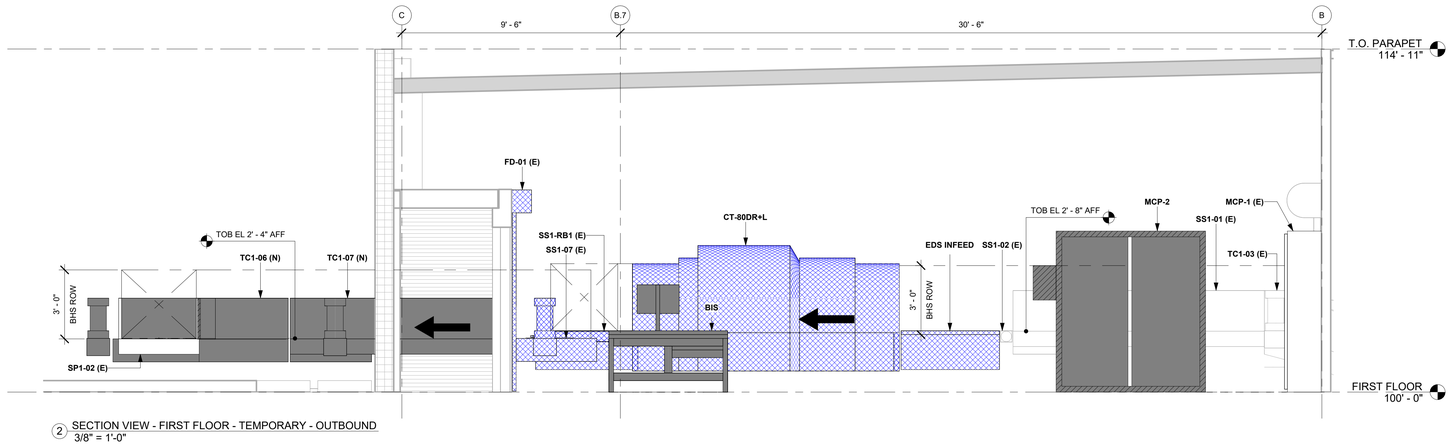
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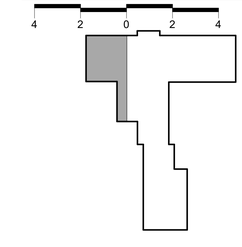
1 SECTION VIEW - FIRST FLOOR - TEMPORARY - EDS
3/8" = 1'-0"



2 SECTION VIEW - FIRST FLOOR - TEMPORARY - OUTBOUND
3/8" = 1'-0"

BHS LEGEND - TEMPORARY

- PROPOSED - TEMPORARY USED IN FINAL CONFIGURATION
- EXISTING CONVEYORS USED IN TEMPORARY
- EXISTING CONVEYORS TO DEMO AFTER TEMPORARY
- EXISTING TO REMAIN



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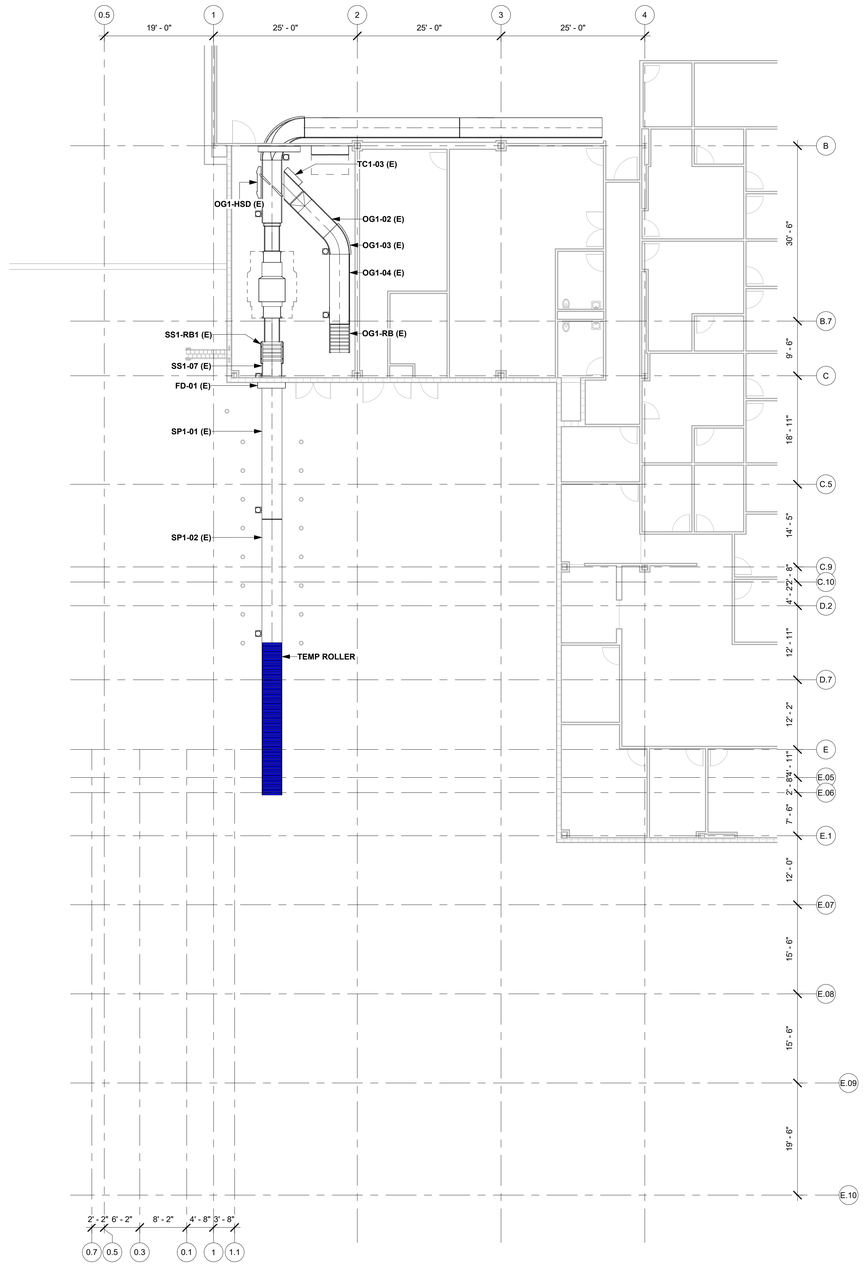
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SHEET CONTENTS
SECTION VIEWS - FIRST FLOOR - TEMPORARY

SHEET NO.:
QB-303

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1 PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 0
3/32" = 1'-0"

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PHASING NOTES:

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OVERVIEW:

- **PHASE 0 INSTALL:** BHS CONTRACTOR TO INSTALL TEMP ROLLER AT THE END OF THE EXISTING RUN OUT LINE (SP1).

- **PHASE 1 DEMO:** BHS CONTRACTOR TO DEMO THE EXISTING OOG LINE. (OG1-HSD,OG1-01 THRU OG1-04, AND OG1-RB).
- **PHASE 1 RELOCATION**: BHS CONTRACTOR TO RELOCATE THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER). RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT.BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 1 INSTALL**: BHS CONTRACTOR TO INSTALL THE EXISTING OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01),THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) AND COMBINE THE WITH NEW CONVEYORS (TC1-06 THRU TC1-09) TO CREATE THE TEMPORARY CONDITION. RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

- **PHASE 2 DEMO:** BHS CONTRACTOR TO DEMO THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) IN THE TEMPORARY CONFIGURATION.
- **PHASE 2 RELOCATION:** BHS CONTRACTOR TO RELOCATE THE NEW CONVEYORS (TC1-06 THRU TC1-09) FROM THE TEMPORARY CONDITION TO THE FINAL CONFIGURATION. NEW CONVEYORS FROM THE TEMPORARY CONDITION (TC1-06 THRU TC1-09) TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 2 INSTALL**: BHS CONTRACTOR TO INSTALL THE NEW
- CONVEYORS (TC1-06 THRU TC1-09) AND COMBINE THEM WITH NEW CONVEYORS (TC1-03 THRU TC1-05) TO CREATE THE FINAL TICKET COUNTER LINE. BHS CONTRACTOR TO INSTALL SECURITY SHUNT LINE 1 (SS1- RB1 & RB2, SS1-BM,SS1-LG), MAKE UP FEED LINE (MF-01 THRU MF-03), AND THE NEW MAKE UP (MU1). NEW CONVEYORS FROM THE TEMPORARY CONDITION (TC1-06 THRU TC1-09) TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

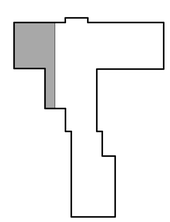
PHASE 0:

- **PHASE 0 DEMO:** NONE
- **PHASE 0 RELOCATION:** NONE
- **PHASE 0 INSTALL:** BHS CONTRACTOR TO INSTALL TEMP ROLLER AT THE END OF THE EXISITNG RUN OUT LINE (SP1).

BHS LEGEND - PHASING

- PHASE 0 - INSTALL
- PHASE 1 - INSTALL
- PHASE 1 - DEMO
- PHASE 1 - RELOCATE
- PHASE 2 - INSTALL
- PHASE 2 - DEMO
- PHASE 2 - RELOCATE
- EXISTING

8 4 0 8 16



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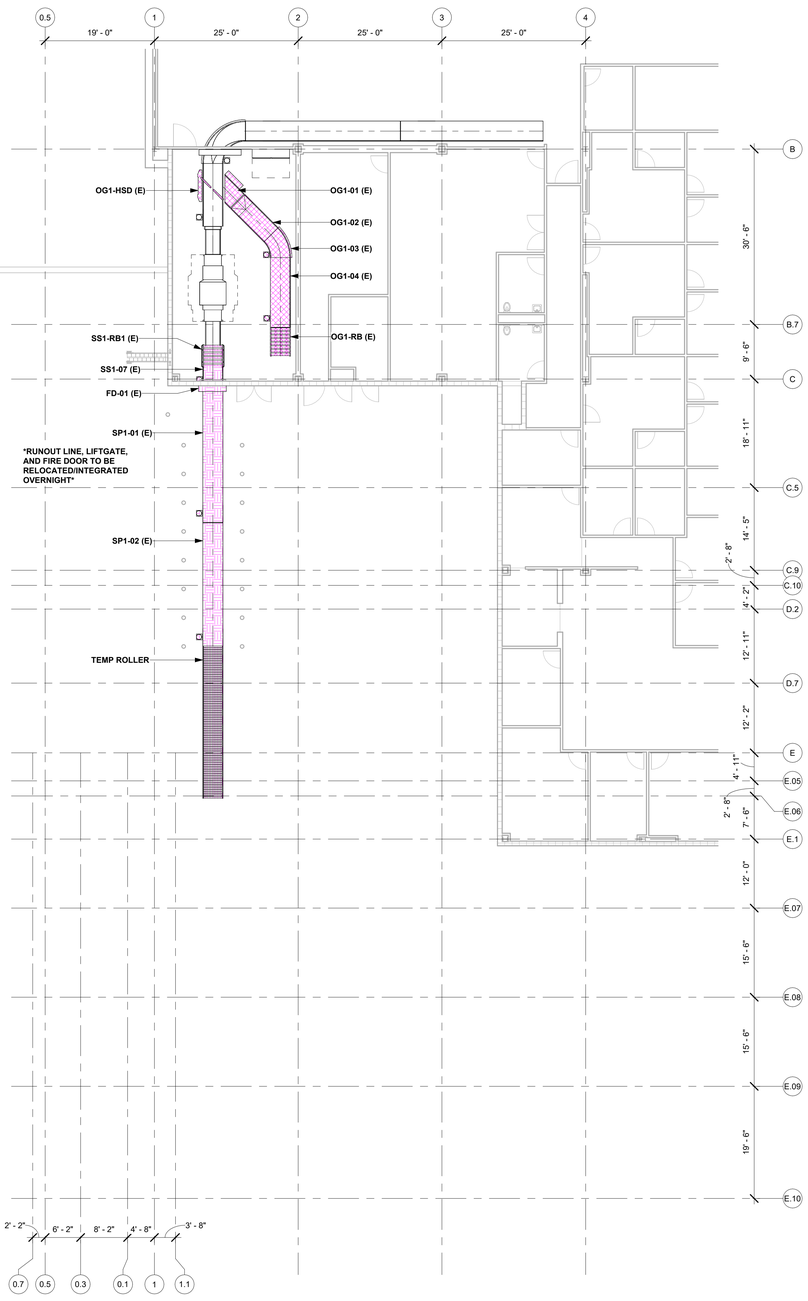
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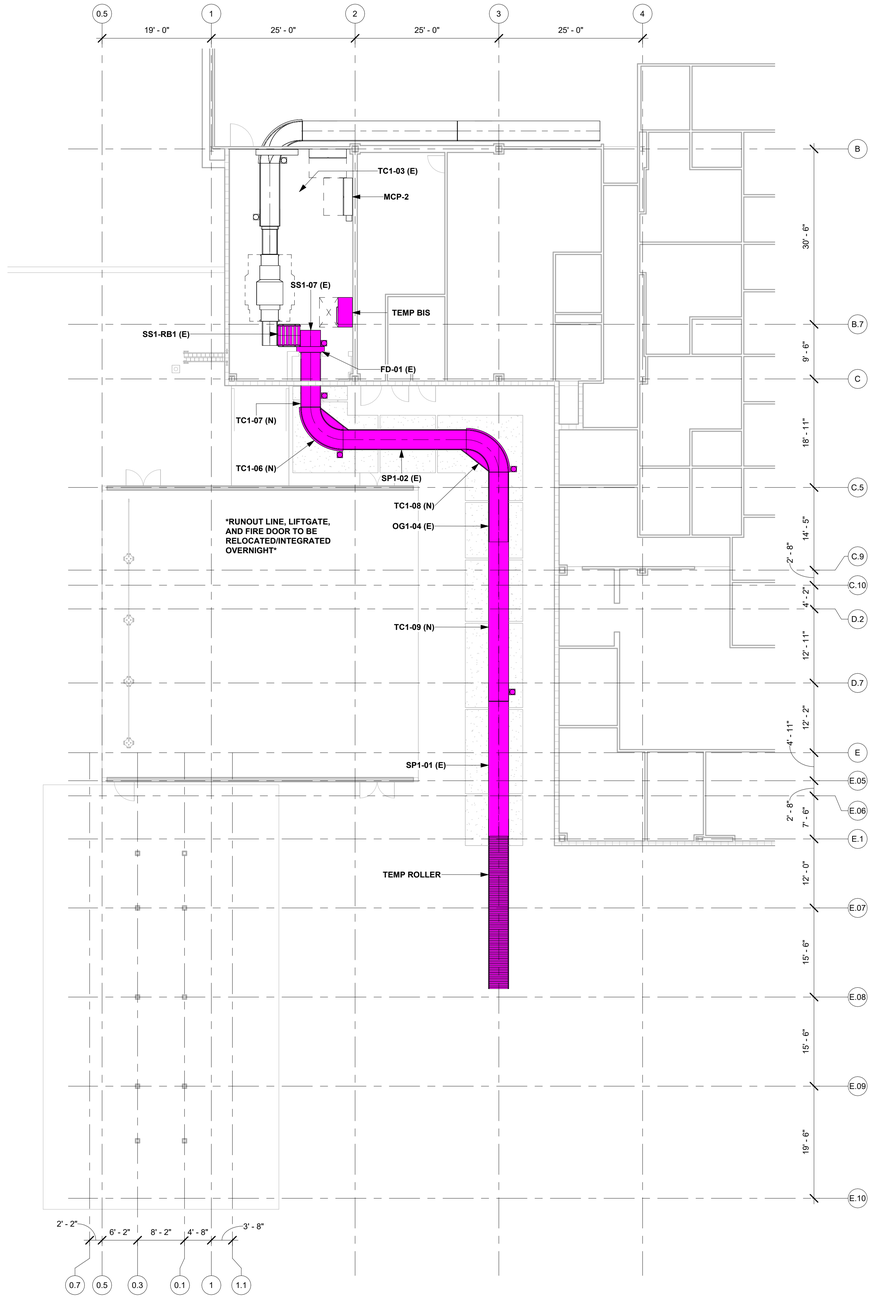
SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 0

SHEET NO.:
QB-450

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1 PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 1 - DEMO/RELOCATE
3/32" = 1'-0"



2 PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 1 - INSTALL
3/32" = 1'-0"

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OVERVIEW:

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- **PHASE 1 RELOCATION**: BHS CONTRACTOR TO RELOCATE THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER). RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT.BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 1 INSTALL**: BHS CONTRACTOR TO INSTALL THE EXISTING OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01),THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) AND COMBINE THESE WITH NEW CONVEYORS(TC1-06 THRU TC1-09) TO CREATE THE TEMPORARY CONDITION. RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

- **PHASE 2 DEMO:**
- **PHASE 2 RELOCATION:**
- **PHASE 1B INSTALL**: BHS CONTRACTOR TO INSTALL THE EXISTING CONVEYORS THAT WERE RELOCATED IN PHASE 1A SS1-07 (E), SP1-02 (E), OG1-04(E), SP1-01(E), FD-01(E). BHS CONTRACTOR TO INSTALL NEW CONVEYORS THAT WILL BE RELOCATED FOR THE FINAL PHASE TC1-06(N), TC1-05(N), TC1-07(N), TC1-08(N). BHS CONTRACTOR TO INSTALL THE FOLLOWING FOR THE TEMPORARY PHASE: TEMP ROLLER BED AT THE END OF SP1-01(E), INSTALL MCP-02 AND ONE TEMPORARY BIS TABLE.
- AT THE END OF PHASE 1B THE SYSTEM IS SETUP IN THE TEMPORARY CONDITION AS SEEN ON QB-130.

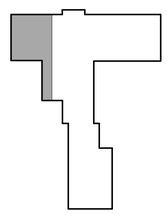
PHASE 1:

- **PHASE 1 DEMO:** BHS CONTRACTOR TO DEMO THE EXISTING OOG LINE. (OG1-HSD,OG1-01 THRU OG1-04, AND OG1-RB).
- **PHASE 1 RELOCATION**: BHS CONTRACTOR TO RELOCATE THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER). RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT.BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 1 INSTALL**: BHS CONTRACTOR TO INSTALL THE EXISTING OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01),THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) AND COMBINE THESE WITH NEW CONVEYORS(TC1-06 THRU TC1-09) TO CREATE THE TEMPORARY CONDITION. RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

BHS LEGEND - PHASING

- PHASE 0 - INSTALL
- PHASE 1 - INSTALL
- PHASE 1 - DEMO
- PHASE 1 - RELOCATE
- PHASE 2 - INSTALL
- PHASE 2 - DEMO
- PHASE 2 - RELOCATE
- EXISTING

8 4 0 8 16



KEY PLAN

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

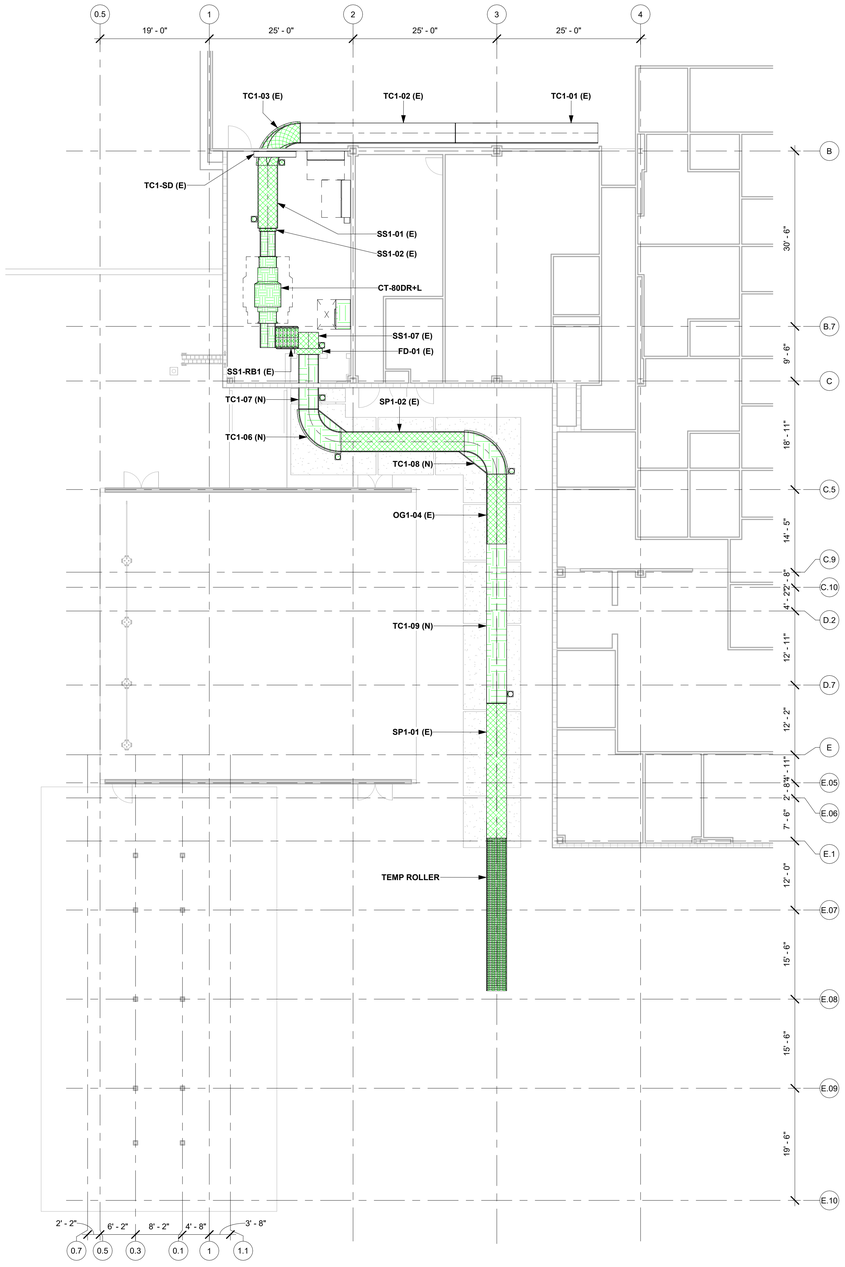
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M&H NO.: 1943000-222814.02
DATE: January 28, 2026
DESIGNED BY: LP
DRAWN BY: LP
CHECKED BY: KT
DO NOT SCALE DRAWINGS

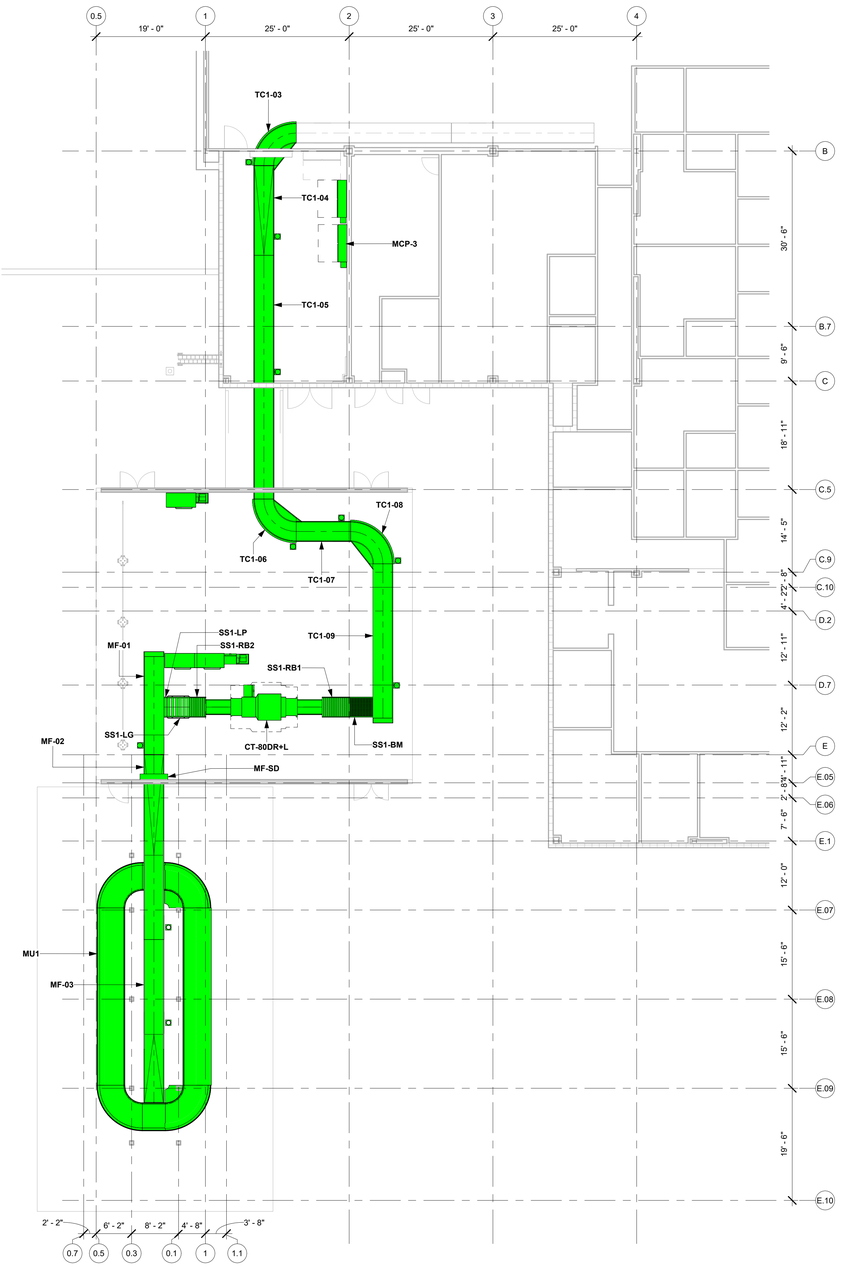
SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 1

SHEET NO.:
QB-451

1/23/2026 5:24:55 PM Autodesk Docs://SBP - 2024/SBP - BHS - 2024.rvt



1 PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 2 - DEMO
3/32" = 1'-0"



2 PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 2 - INSTALL
3/32" = 1'-0"

NOTES:

- ELEVATIONS ARE REFERENCED ABOVE FINISHED FLOOR ELEVATION.
- BHS CONTRACTOR TO FIELD VERIFY ELEVATIONS, EXISTING CONDITIONS OF FLOOR FLATNESS AND FLOOR LEVELNESS PRIOR TO SHOP DRAWING DEVELOPMENT.
- SPEEDS ARE FOR REFERENCE ONLY.
- BHS CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF THE INTEGRATION REQUIREMENTS OF SYSTEMS IN THE PROPOSED DESIGNS. THIS INCLUDES, BUT NOT LIMITED TO ALL EXISTING SYSTEMS. FOR EXAMPLE, EDS MACHINES, ACCESS CONTROL DEVICES, FIRE MANAGEMENT SYSTEMS, ETC. VERIFICATION SHALL BE COMPLETED PRIOR TO SHOP DRAWINGS.
- BHS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS OF PROPOSED WORK PRIOR TO CONSTRUCTION.

PHASING NOTES:

- BHS CONTRACTOR SHALL LIMIT OPERATIONAL IMPACTS DURING CONSTRUCTION. ALL ACTIVITIES THAT REQUIRE SHUT DOWN OF SYSTEM SHALL BE COORDINATED WITH THE AIRPORT AND ALL AFFECTED STAKEHOLDERS.
- THE PROVIDED PHASING PLAN IS FOR REFERENCE ONLY. THE BHS CONTRACTOR SHALL PROVIDE A PHASING PLAN WITH PROJECT SCHEDULE FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION.
- UPON COMPLETION OF PROJECT, ALL REMAINING STAGING AND LAYDOWN AREAS SHALL BE REMOVED AND RESTORED TO THE PERMANENT FUNCTION. TEMPORARY PROVISION AND FACILITIES WILL BE REMOVED.

OVERVIEW:

- **PHASE 0 INSTALL:** BHS CONTRACTOR TO INSTALL TEMP ROLLER AT THE END OF THE EXISTING RUN OUT LINE (SP1).

- **PHASE 1 DEMO:** BHS CONTRACTOR TO DEMO THE EXISTING OOG LINE. (OG1-HSD,OG1-01 THRU OG1-04, AND OG1-RB).
- **PHASE 1 RELOCATION**: BHS CONTRACTOR TO RELOCATE THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER). RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT.BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 1 INSTALL**: BHS CONTRACTOR TO INSTALL THE EXISTING OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01),THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) AND COMBINE THE WITH NEW CONVEYORS (TC1-06 THRU TC1-09) TO CREATE THE TEMPORARY CONDITION. RUNOUT LINE, LIFTGATE, AND FIRE DOOR TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

- **PHASE 2 DEMO:** BHS CONTRACTOR TO DEMO THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) IN THE TEMPORARY CONFIGURATION .
- **PHASE 2 RELOCATION:** BHS CONTRACTOR TO RELOCATE THE NEW CONVEYORS (TC1-06 THRU TC1-09) FROM THE TEMPORARY CONDITION TO THE FINAL CONFIGURATION. NEW CONVEYORS FROM THE TEMPORARY CONDITION (TC1-06 THRU TC1-09) TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 2 INSTALL**: BHS CONTRACTOR TO INSTALL THE NEW CONVEYORS (TC1-06 THRU TC1-09) AND COMBINE THEM WITH NEW CONVEYORS (TC1-03 THRU TC1-05) TO CREATE THE FINAL TICKET COUNTER LINE. BHS CONTRACTOR TO INSTALL SECURITY SHUNT LINE 1 (SS1- RB1 & RB2, SS1-BM,SS1-LG), MAKE UP FEED LINE (MF-01 THRU MF-03), AND THE NEW MAKE UP (MU1). NEW CONVEYORS FROM THE TEMPORARY CONDITION (TC1-06 THRU TC1-09) TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

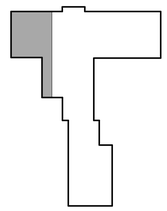
PHASE 2:

- **PHASE 2 DEMO:** BHS CONTRACTOR TO DEMO THE OUTFEED OF THE EDS (SS1-07 & SS1-RB1), THE EXISTING FIRE DOOR (FD-01) AND THE EXISTING RUN OUT LINE (SP1-01 THRU SP1-02, TEMP ROLLER) IN THE TEMPORARY CONFIGURATION .
- **PHASE 2 RELOCATION:** BHS CONTRACTOR TO RELOCATE THE NEW CONVEYORS (TC1-06 THRU TC1-09) FROM THE TEMPORARY CONDITION TO THE FINAL CONFIGURATION. NEW CONVEYORS FROM THE TEMPORARY CONDITION (TC1-06 THRU TC1-09) TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.
- **PHASE 2 INSTALL**: BHS CONTRACTOR TO INSTALL THE NEW CONVEYORS (TC1-06 THRU TC1-09) AND COMBINE THEM WITH NEW CONVEYORS (TC1-03 THRU TC1-05) TO CREATE THE FINAL TICKET COUNTER LINE. BHS CONTRACTOR TO INSTALL SECURITY SHUNT LINE 1 (SS1- RB1 & RB2, SS1-BM,SS1-LG), MAKE UP FEED LINE (MF-01 THRU MF-03), AND THE NEW MAKE UP (MU1). NEW CONVEYORS FROM THE TEMPORARY CONDITION (TC1-06 THRU TC1-09) TO BE RELOCATED/INTEGRATED OVERNIGHT. BHSC TO COORDINATE WITH AIRPORT OPERATIONS.

BHS LEGEND - PHASING

- PHASE 0 - INSTALL
- PHASE 1 - INSTALL
- PHASE 1 - DEMO
- PHASE 1 - RELOCATE
- PHASE 2 - INSTALL
- PHASE 2 - DEMO
- PHASE 2 - RELOCATE
- EXISTING

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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

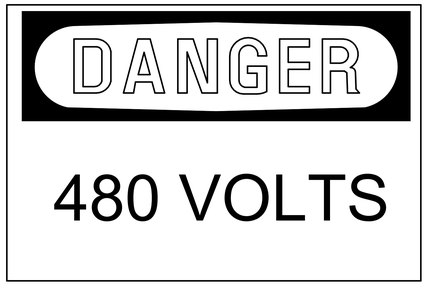
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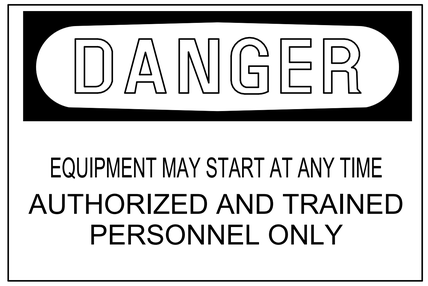
SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - PHASE 2

SHEET NO.:
QB-452

1/23/2026 5:24:56 PM Autodesk Docs://SBP - 2024/SBP - BHS_2024.rvt



1 SAFETY SIGN - DANGER 480 VOLTS
12" = 1'-0"



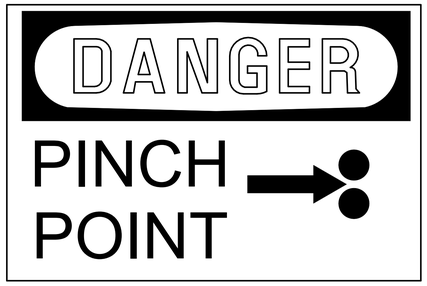
2 SAFETY SIGN - DANGER AUTHORIZED PERSONNEL ONLY
12" = 1'-0"



3 SAFETY SIGN - DANGER MOVING MACHINERY
12" = 1'-0"



4 SAFETY SIGN - DANGER MOVING EQUIPMENT
12" = 1'-0"



5 SAFETY SIGN - DANGER PINCH POINT
12" = 1'-0"



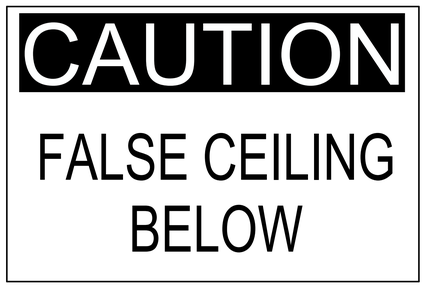
6 SAFETY SIGN - CAUTION STEP DOWN
12" = 1'-0"



7 SAFETY SIGN - CAUTION DO NOT STAND ON CONVEYOR
12" = 1'-0"



8 SAFETY SIGN - CAUTION STEP UP
12" = 1'-0"



9 SAFETY SIGN - CAUTION FALSE CEILING
12" = 1'-0"



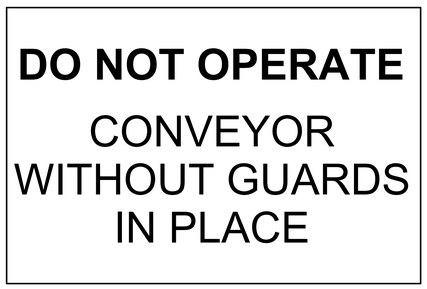
10 SAFETY SIGN - CAUTION KEEP LOOSE CLOTHING CLEAR
12" = 1'-0"



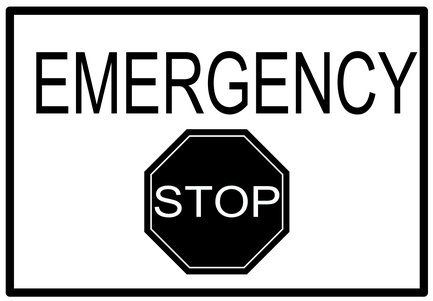
11 SAFETY SIGN - CAUTION LOW HEADROOM
12" = 1'-0"



12 SAFETY SIGN - CAUTION AUTO START
12" = 1'-0"



13 SAFETY SIGN - DO NOT OPERATE CONVEYOR W/O GUARDS
12" = 1'-0"



14 SAFETY SIGN - EMERGENCY STOP
12" = 1'-0"

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BAGGAGE SCREENING MODS.
975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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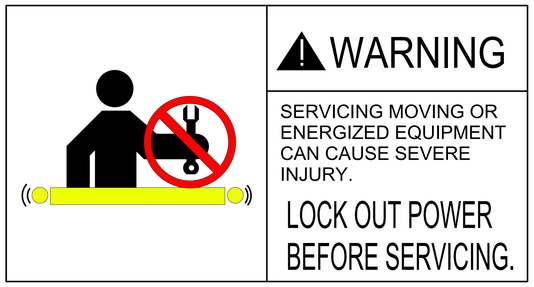
SHEET CONTENTS:
TYPICAL DETAILS - SAFETY SIGNAGE

SHEET NO.:
QB-500

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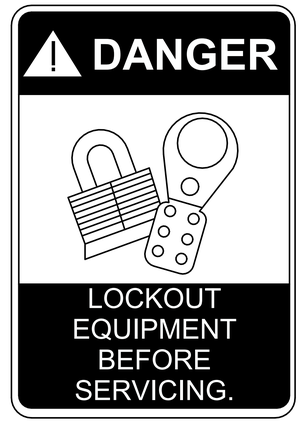
1 SAFETY SIGN - DANGER KEEP OFF
12" = 1'-0"



2 SAFETY SIGN - WARNING LOCK OUT POWER BEFORE SERVICING
12" = 1'-0"



3 SAFETY SIGN - DANGER HIGH VOLTAGE
12" = 1'-0"



4 SAFETY SIGN - DANGER LOCKOUT EQUIPMENT BEFORE SERVICING
12" = 1'-0"

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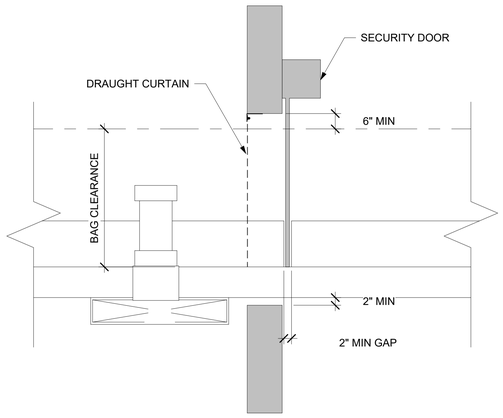
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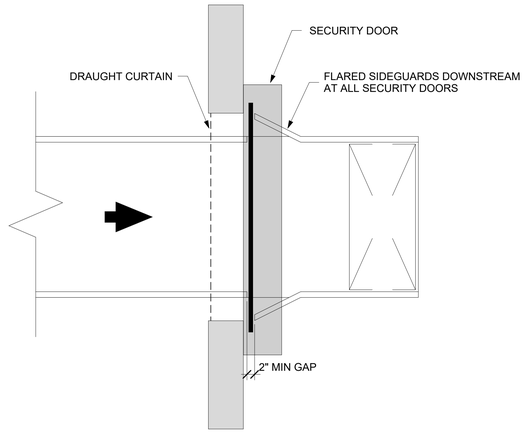
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TYPICAL DETAILS - SAFETY SIGNAGE

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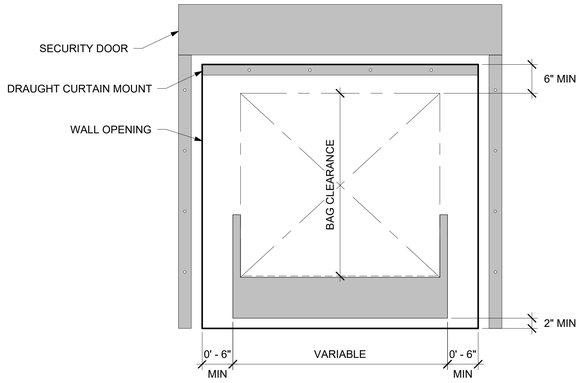
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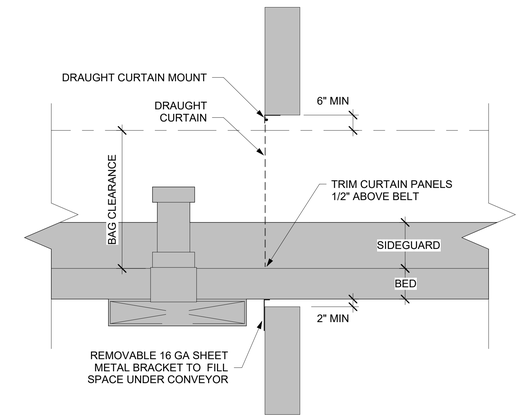
1 SECURITY DOOR - TYPICAL ELEVATION
3/8" = 1'-0"



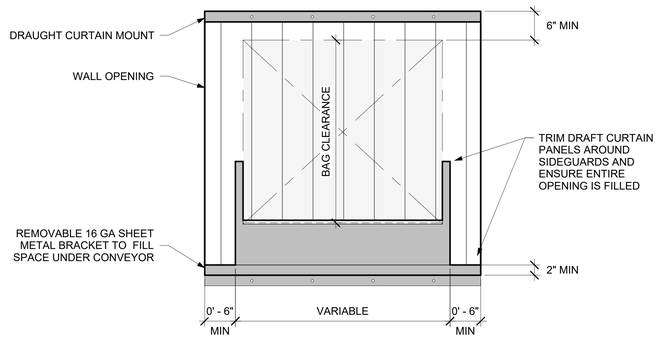
2 SECURITY DOOR - TYPICAL PLAN VIEW
3/8" = 1'-0"



3 SECURITY DOOR - TYPICAL SECTION
1" = 1'-0"



5 DRAFT CURTAIN - TYPICAL ELEVATION
3/8" = 1'-0"



4 DRAFT CURTAIN - TYPICAL SECTION
1" = 1'-0"

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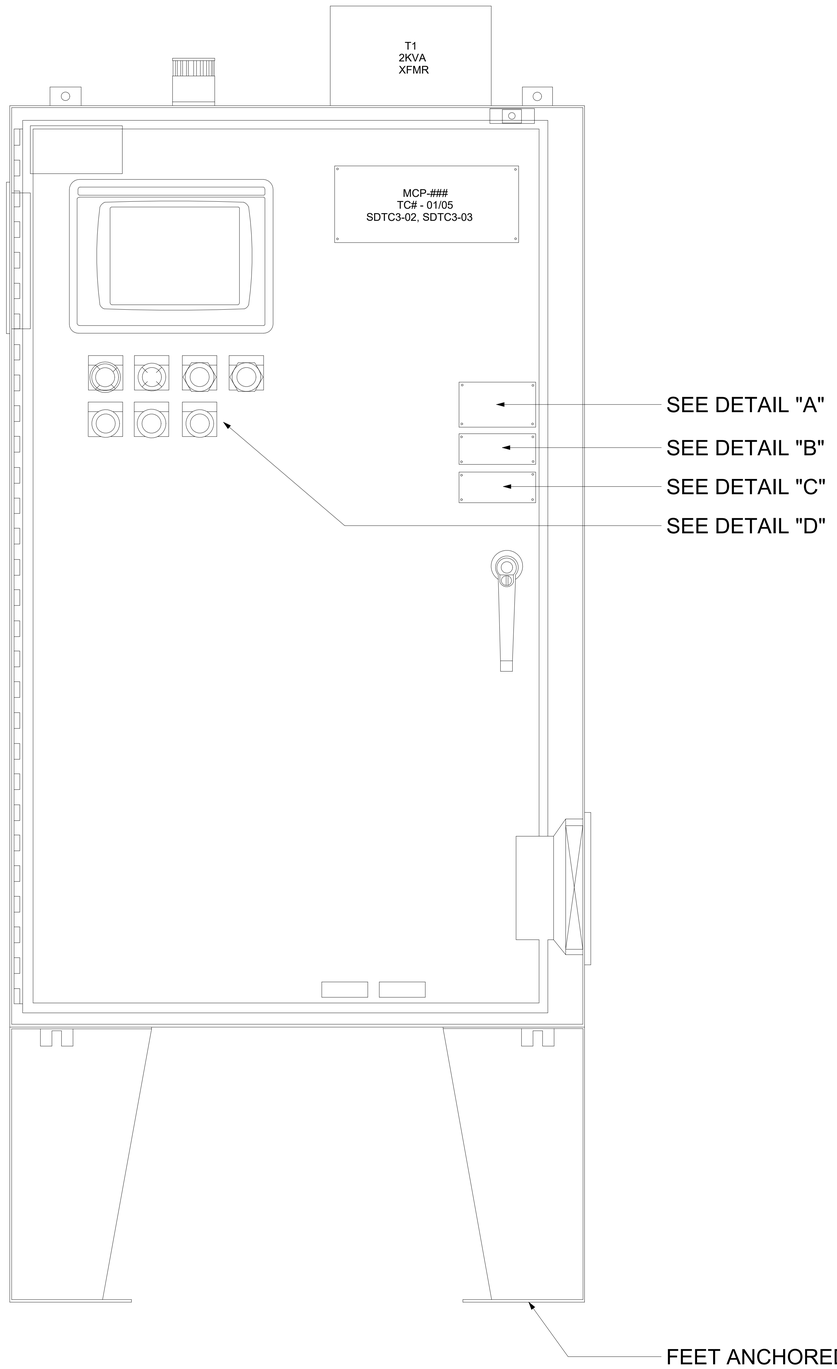
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SHEET CONTENTS:
TYPICAL DETAILS - SECURITY DOOR

SHEET NO.:
QB-502

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MANUFACTURER:	XXXX
SUPPLY VOLTAGE:	480 VAC
CONTROL VOLTAGE:	120 VAC
FULL LOAD CURRENT:	XXXX
LARGEST HP RATING:	XHP
PHASE:	3PH
FREQUENCY:	60HZ
CONTROL PANEL #:	MCP-XXX
SCCR:	XXKA
ENCLOSURE DRAWING#:	XXX-XXX-XXX
POWER SOURCE:	XXXX
ENCLOSURE RATING:	UL TYPE X

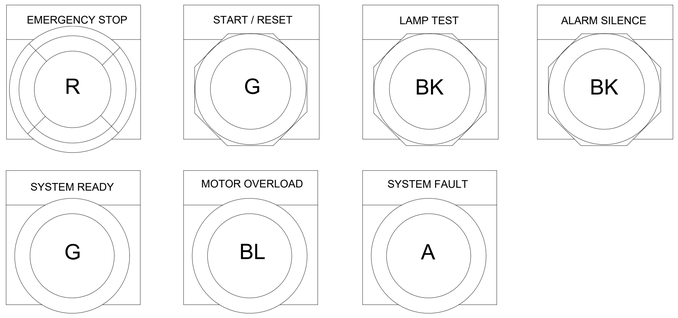
DETAIL "A"

CAUTION:
THIS CONTROL CABINET CONTAINS
YELLOW WIRES WHICH WILL REMAIN
"HOT" WHEN THE DISCONNECT IS
TURNED OFF.

DETAIL "B"

NEMA RATING:
TYPE 12

DETAIL "C"



DETAIL "D"

BHS LEGEND - CONTROLS

- ILLUMINATED MUSHROOM STYLE PUSH / PULL TOP WITH LOCKING CAPABILITY
- FLAT PUSH BUTTON
- ILLUMINATED PUSH BUTTON WITH PUSH LAMP TEST CAPABILITY
- ILLUMINATED LIGHT/LAMP
- SELECTOR SWITCH
- AUDIBLE ALARM
- KEYED SWITCH

G = GREEN	BK = BLACK
A = AMBER	BL = BLUE
R = RED	W = WHITE

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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

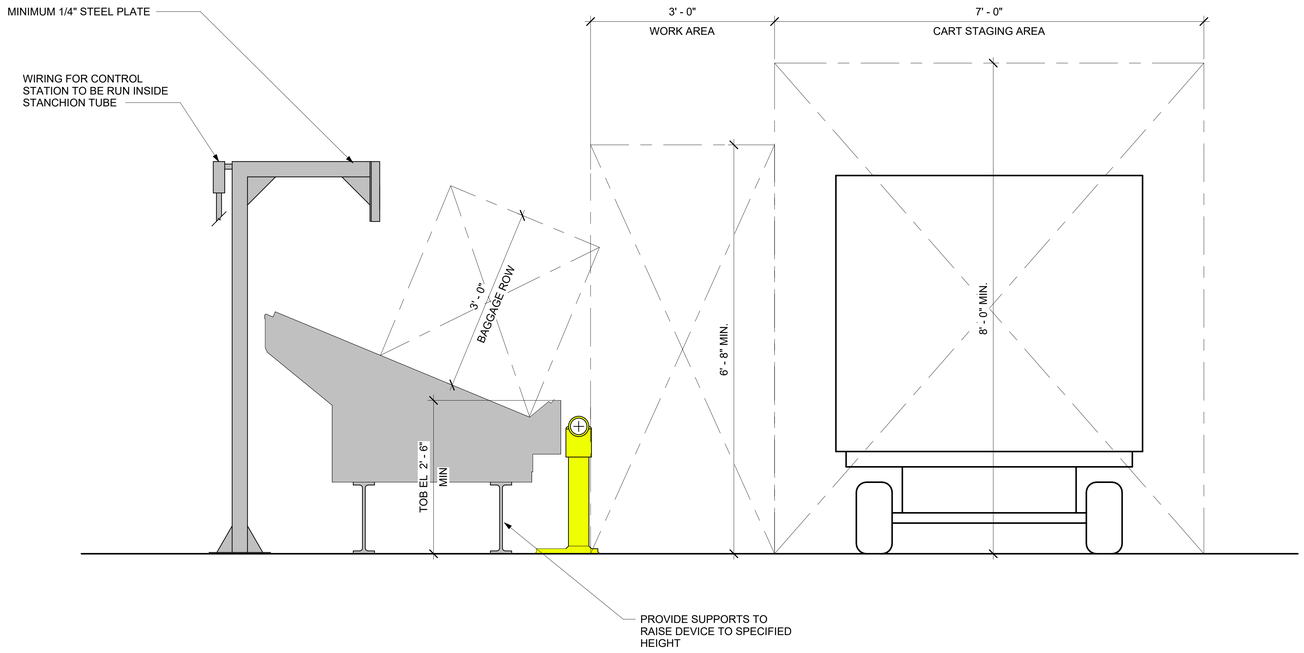
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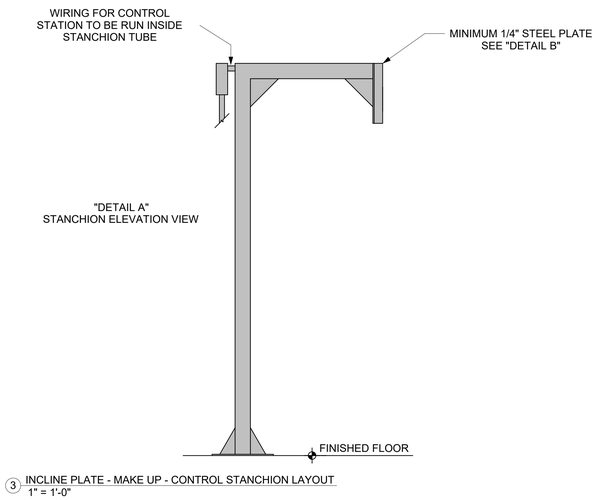
SHEET CONTENTS
TYPICAL DETAILS - MCP CABINET

SHEET NO.:
QB-503

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1 INCLINE PLATE MAKE-UP - CONTROL STANCHION & IMPACT PROTECTION
1" = 1'-0"



3 INCLINE PLATE - MAKE UP - CONTROL STANCHION LAYOUT
1" = 1'-0"

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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

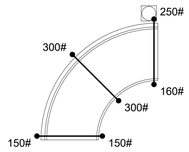
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SHEET CONTENTS
TYPICAL DETAILS - INCLINE PLATE - MAKE-UP

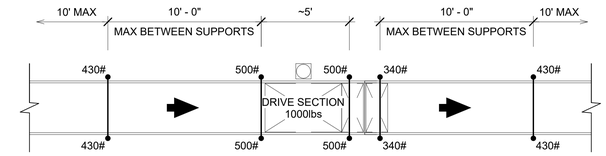
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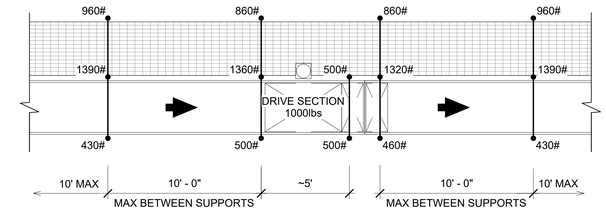


90° POWER CURVE
1310lbs

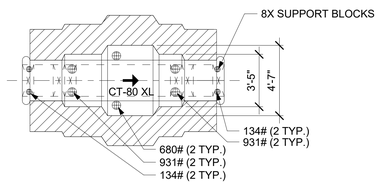
1 8-1.01_LOADS - POWER TURNS
1/4" = 1'-0"



3 8-1.03_LOADS - SINGLE CONVEYOR
1/4" = 1'-0"



4 8-1.04_LOADS - SINGLE CONVEYOR & CATWALK
1/4" = 1'-0"



15 8-1.21_Loads - CT80 XL
1/4" = 1'-0"

GENERAL NOTES

1.) THE POINT LOAD DRAWINGS REPRESENT TYPICAL CONVEYOR SEGMENTS AND ARE FOR REFERENCE ONLY. THE BHS CONTRACTOR IS RESPONSIBLE TO SUBMIT LOAD CALCULATIONS, SUPPORT AND ATTACHMENT DETAILS BY A REGISTERED P.E. IN THE STATE IN WHICH THE WORK WILL BE PERFORMED AND SHALL COMPLY WITH ALL LOCAL, STATE AND GOVERNING CODES.

2.) LOAD CALCULATIONS, SUPPORT AND ATTACHMENT DETAILS ARE TO BE SUBMITTED TO THE OWNER OR THEIR REPRESENTATIVE FOR REVIEW BEFORE INSTALLATION OF BHS EQUIPMENT.

3.) THE POINT LOADS PLACEMENT DIAGRAMS AND CONFIGURATIONS SHOWN REPRESENT A TYPICAL POSSIBLE CONFIGURATION AND DO NOT ENCOMPASS ALL POSSIBLE CONFIGURATIONS WHICH MAY BE UTILIZED.

4.) VIBRATION ISOLATION IS TO BE INSTALLED IN CONJUNCTION WITH ALL SUPPORTS ATTACHED TO BUILDING STRUCTURE AND IS TO BE INCLUDED WITH BASE BID.

5.) ALL CONVEYORS ARE DESIGNED TO SUPPORT A CONCENTRATED STATIC LOAD OF 250 LBS.

6.) THE LIVE LOAD FOR TRANSPORT CONVEYOR IS CALCULATED AS 40 LBS/FT
THE LIVE LOAD FOR LOAD/UNLOAD CONVEYORS IS CALCULATED AS 60 LS/FT.
THE LIVE LOAD FOR CATWALK IS CALCULATED AS 45 LBS/FT

7.) THE FOLLOWING WEIGHTS WERE USED FOR DETERMINING THE EQUIPMENT LOADS (STATIC & DYNAMIC) GENERATED BY THE CONVEYOR EQUIPMENT

39" WIDE STANDARD CONVEYOR

STANDARD BED SECTION	85	LBS/FT
DRIVE SECTION	1000	LBS
STANDARD QUEUE	880	LBS
18" END TAKE-UP	240	LBS
9" END TAKE-UP	130	LBS
10' RADIUS BREAKOVER	350	LBS
30° POWER CURVE	620	LBS
45° POWER CURVE	830	LBS
90° POWER CURVE	1310	LBS
45° MERGE (3' CENTERLINE)	820	LBS
45° MERGE (5' CENTERLINE)	1250	LBS

57" WIDE OVER-SIZE CONVEYOR

STANDARD BED SECTION	105	LBS
DRIVE SECTION	1600	LBS
STANDARD QUEUE	1340	LBS
18" END TAKE-UP	320	LBS
9" END TAKE-UP	170	LBS
10' RADIUS BREAKOVER	420	LBS
30° POWER CURVE	830	LBS
45° POWER CURVE	1110	LBS
90° POWER CURVE	1390	LBS
45° MERGE (3' CENTERLINE)	1100	LBS
45° MERGE (5' CENTERLINE)	1680	LBS

OTHER EQUIPMENT

HIGH SPEED DIVERTER	1400	LBS
AUTOMATIC TAG READER	500	LBS
CLAIM OR MAKE-UP DEVICE	200	LBS/FT
VERTISORTER/VERTIMERGE	4590	LBS
CATWALK	65	LBS/SQ FT

8.)

SYMBOL	DESCRIPTION
	CONCENTRATED POINT LOAD
	CONVEYOR SUPPORT

9.) HANDRAILS TO BE DESIGNED TO RESIST A LOAD OF 20 LBS/FT TO THE TOP RAIL, 50 LBS ON A 1 SQ FT AREA ON THE MID RAIL AND A SINGLE CONCENTRATED LOAD OF 200 LBS APPLIED IN ANY DIRECTION ALONG THE TOP.

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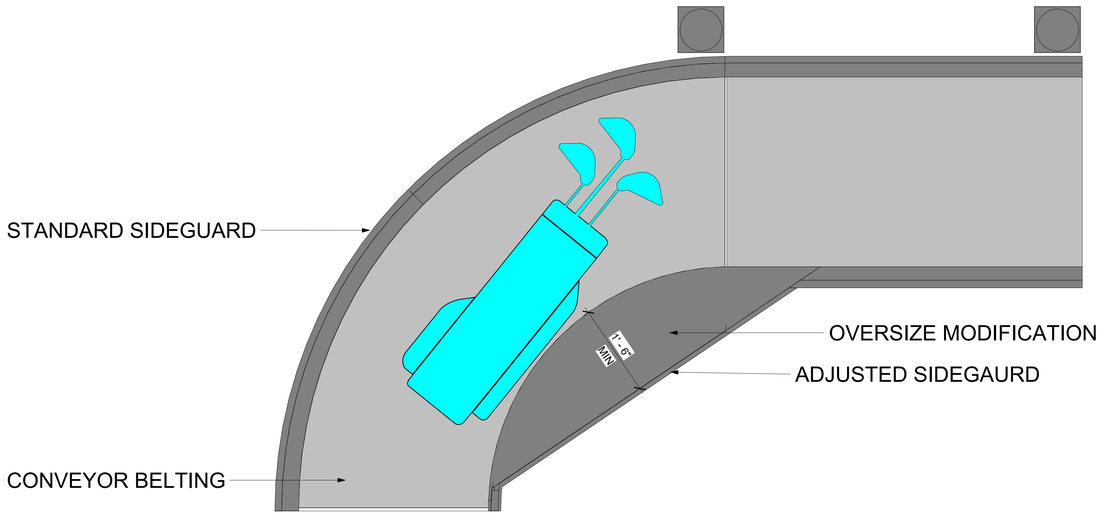
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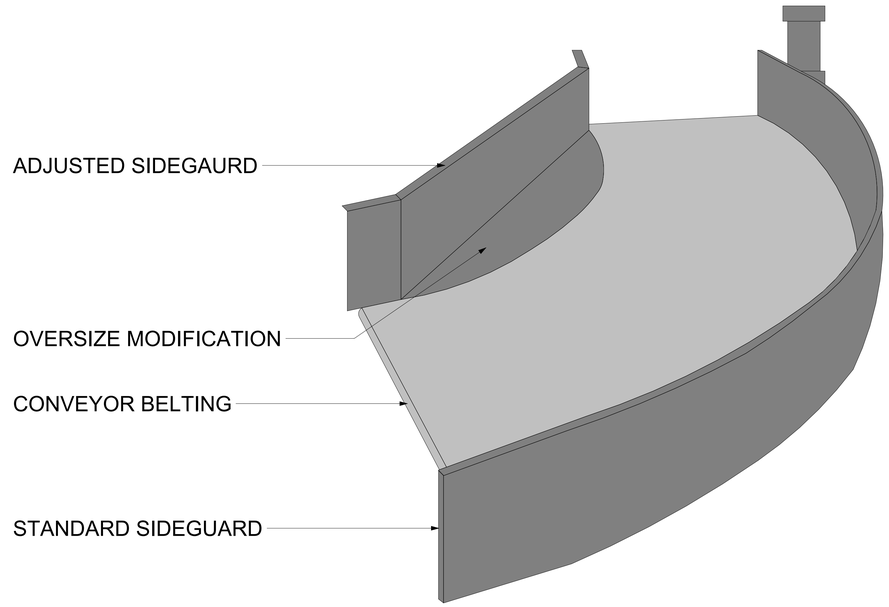
SHEET CONTENTS
TYPICAL DETAILS - LOADING DETAILS

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QB-505

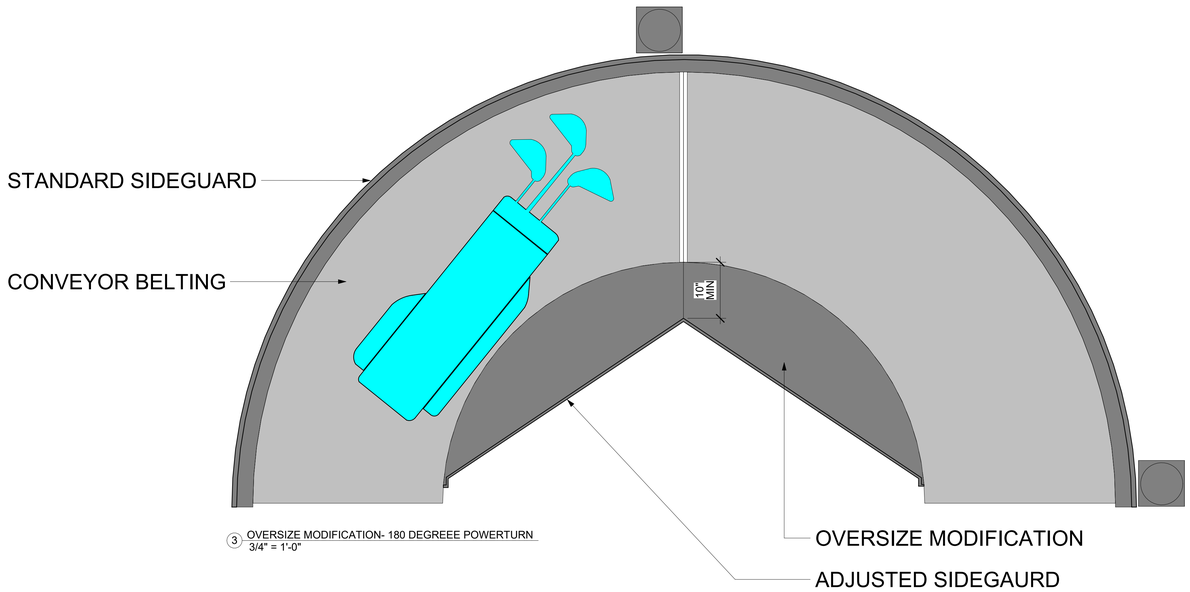
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1 OVERSIZE MODIFICATION- 90 DEGREEE POWERTURN
3/4" = 1'-0"



2 OVERSIZE MODIFICATION- 3D VIEW
3/4" = 1'-0"



3 OVERSIZE MODIFICATION- 180 DEGREEE POWERTURN
3/4" = 1'-0"

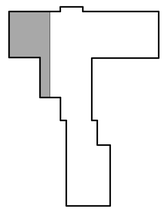
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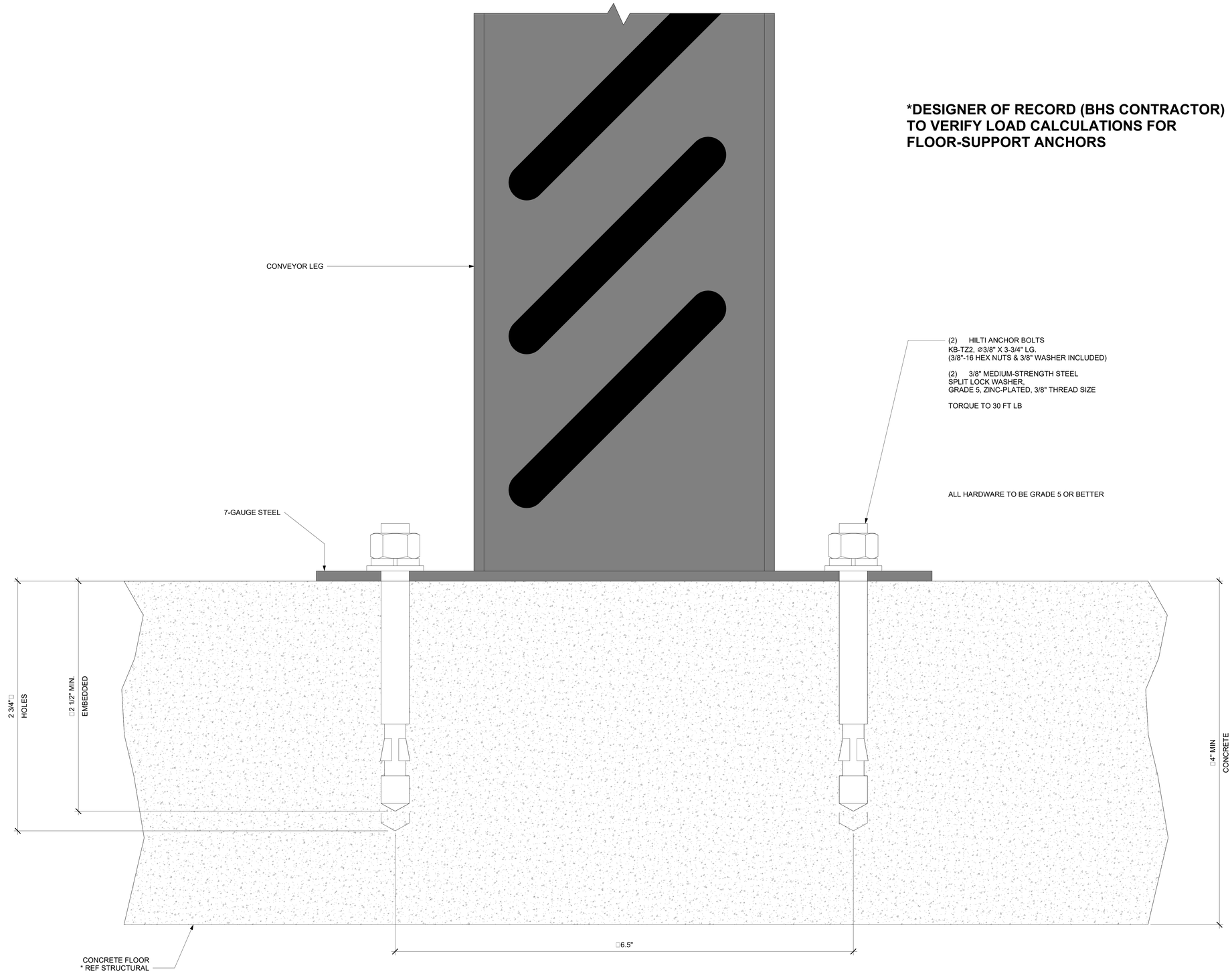
SHEET CONTENTS
TYPICAL DETAILS - OVERSIZE SIDEGUARD MODIFICATION

SHEET NO.:
QB-506

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2

***DESIGNER OF RECORD (BHS CONTRACTOR) TO VERIFY LOAD CALCULATIONS FOR FLOOR-SUPPORT ANCHORS**



1 FLOOR SUPPORT ANCHOR CONNECTION
12" = 1'-0"

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2	01/28/26	PERMIT REVISIONS

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SHEET CONTENTS
TYPICAL DETAILS - FLOOR SUPPORT ANCHORS

SHEET NO.:

QB-507

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NOTES:
- ELEVATIONS ARE REFERENCED ABOVE FINISHED FLOOR ELEVATION.
- BHS CONTRACTOR TO FIELD VERIFY ELEVATIONS, EXISTING CONDITIONS OF FLOOR FLATNESS AND FLOOR LEVELNESS PRIOR TO SHOP DRAWING DEVELOPMENT.
- SPEEDS ARE FOR REFERENCE ONLY.
- BHS CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF THE INTEGRATION REQUIREMENTS OF SYSTEMS IN THE PROPOSED DESIGNS. THIS INCLUDES, BUT NOT LIMITED TO ALL EXISTING SYSTEMS. FOR EXAMPLE, EDS MACHINES, ACCESS CONTROL DEVICES, FIRE MANAGEMENT SYSTEMS, ETC. VERIFICATION SHALL BE COMPLETED PRIOR TO SHOP DRAWINGS.
- BHS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS OF PROPOSED WORK PRIOR TO CONSTRUCTION.

EXISTING

CONVEYOR MANIFEST - EXISTING TO REMAIN			
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE	SPEED
TC1-01 (E)	TRANSPORT CONVEYOR	24' - 10"	90
TC1-02 (E)	TRANSPORT CONVEYOR	26' - 11 1/2"	90
TC1-SD (E)	SECURITY DOOR		
3		51' - 9 1/2"	

CONVEYOR MANIFEST - EXISTING - DEMO	
CONVEYOR ID	DESCRIPTION
OG1-01 (E)	REVERSE MERGE
OG1-02 (E)	BREAKOVER
OG1-03 (E)	POWERTURN
OG1-04 (E)	TRANSPORT CONVEYOR
OG1-HSD (E)	HIGH SPEED DIVERT
OG1-RB (E)	BHS-ROLLER CONVEYOR - 5' SECTION
SS1-01 (E)	TRANSPORT CONVEYOR
SS1-02 (E)	BHS-ROLLER CONVEYOR - 6 in SECTION
TC1-03 (E)	POWERSPIRAL
9	

CONVEYOR MANIFEST - EXISTING - RELOCATE		
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE
FD-01 (E)	SECURITY DOOR	
OG1-04 (E)	TRANSPORT CONVEYOR	12' - 2 1/2"
SP1-01 (E)	TRANSPORT CONVEYOR	23' - 6"
SP1-02 (E)	TRANSPORT CONVEYOR	21' - 6"
SS1-07 (E)	QUEUE	3' - 6"
SS1-RB1 (E)	BHS-ROLLER CONVEYOR - LIFT GATE	4' - 0"
TEMP ROLLER	ROLLERBED	26' - 6"
7		

THESE ITEMS TO BE RELOCATED TO TEMPORARY CONFIGURATION THEN DEMOLISHED AFTER TEMPORARY PHASE. SEE PHASING SHEETS

TEMPORARY

CONVEYOR MANIFEST - TEMPORARY - PROPOSED TO REMAIN				
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE	SPEED	VFD
TC1-06 (N)	POWERTURN OS	8' - 10"	120	Yes
TC1-07 (N)	TRANSPORT CONVEYOR	9' - 6 1/4"	90	Yes
TC1-08 (N)	POWERTURN OS	8' - 10"	180	Yes
TC1-09 (N)	TRANSPORT CONVEYOR	27' - 9"	120	Yes
4		54' - 11 1/4"		

THESE ITEMS TO BE RELOCATED TO PROPOSED CONFIGURATION AFTER TEMPORARY PHASE. SEE PHASING SHEETS

PROPOSED

CONVEYOR MANIFEST - PROPOSED - TICKET COUNTER				
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE	SPEED	VFD
TC1-03	POWERTURN OS	8' - 10"	120	Yes
TC1-04	INCLINE - DECLINE - STRAIGHT	15' - 7 1/2"	150	Yes
TC1-05	TRANSPORT CONVEYOR	42' - 5 1/2"	180	Yes
TC1-06	POWERTURN OS	8' - 10"	180	Yes
TC1-07	TRANSPORT CONVEYOR	9' - 6 1/4"	150	Yes
TC1-08	POWERTURN OS	8' - 10"	120	Yes
TC1-09	TRANSPORT CONVEYOR	27' - 9"	90	Yes
7		121' - 10 1/2"		

CONVEYOR MANIFEST - PROPOSED - SECURITY SHUNT LINE 1 - ROLLERBED				
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE	SPEED	VFD
SS1-BM	BHS-CONVEYOR-BALL MAT	4' - 0"		
SS1-LG	BHS-ROLLER CONVEYOR - LIFT GATE	4' - 0"		
SS1-RB1	ROLLERBED	4' - 9 3/4"		
SS1-RB2	ROLLERBED	2' - 9 1/2"		
4		15' - 7 1/4"		

CONVEYOR MANIFEST - PROPOSED - MAKE-UP FEED				
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE	SPEED	VFD
MF-01	TRANSPORT CONVEYOR	17' - 11 1/2"	90	Yes
MF-02	BREAKOVER	33' - 0"	120	Yes
MF-03	BREAKOVER	28' - 10 3/4"	90	Yes
MF-SD	SECURITY DOOR			No
4		79' - 10 1/4"		

CONVEYOR MANIFEST - PROPOSED - MAKE UP				
CONVEYOR ID	DESCRIPTION	LENGTH CENTERLINE	SPEED	VFD
MU1	MAKE-UP - INCLINE PLATE - STRAIGHT	4' - 0"	90	
MU1	MAKE-UP - INCLINE PLATE - STRAIGHT - MOTOR LOCATION	30' - 10 1/4"	90	Yes
MU1	MAKE-UP - INCLINE PLATE - CURVE - 90	9' - 2"	90	
MU1	MAKE-UP - INCLINE PLATE - CURVE - 90	9' - 2"	90	
MU1	MAKE-UP - INCLINE PLATE - STRAIGHT - MOTOR LOCATION	30' - 10 1/4"	90	Yes
MU1	MAKE-UP - INCLINE PLATE - STRAIGHT	4' - 0"	90	
MU1	MAKE-UP - INCLINE PLATE - CURVE - 90	9' - 2"	90	
MU1	MAKE-UP - INCLINE PLATE - CURVE - 90	9' - 2"	90	
8		106' - 4"		

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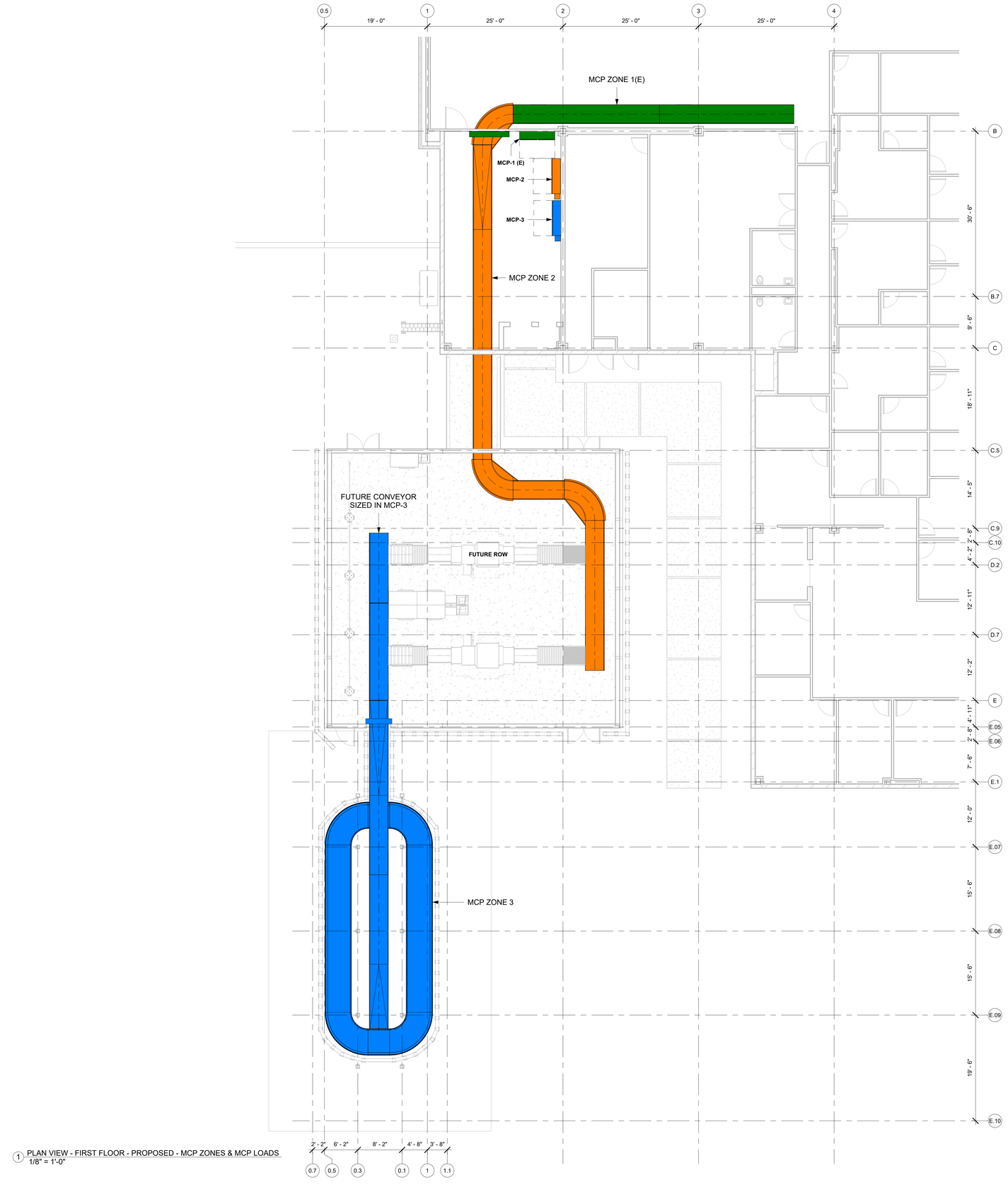
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SHEET CONTENTS
CONVEYOR MANIFEST

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QB-600

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1 PLAN VIEW - FIRST FLOOR - PROPOSED - MCP ZONES & MCP LOADS
1/8" = 1'-0"

NOTES:

- ELEVATIONS ARE REFERENCED ABOVE FINISHED FLOOR ELEVATION.
- BHS CONTRACTOR TO FIELD VERIFY ELEVATIONS, EXISTING CONDITIONS OF FLOOR FLATNESS AND FLOOR LEVELNESS PRIOR TO SHOP DRAWING DEVELOPMENT.
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- BHS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS OF PROPOSED WORK PRIOR TO CONSTRUCTION.
- MCP LAYOUR AND LOADS FOR REFERENCE ONLY.

ELECTRICAL LOADS - MCP-2			
CONVEYOR ID	DESCRIPTION	HP	FLA
TC1-03	POWERTURN OS	1.5	2.8
TC1-04	INCLINE - DECLINE - STRAIGHT	2	3.4
TC1-05	TRANSPORT CONVEYOR	3	4.8
TC1-06	POWERTURN OS	1.5	2.8
TC1-07	TRANSPORT CONVEYOR	1.5	2.8
TC1-08	POWERTURN OS	1.5	2.8
TC1-09	TRANSPORT CONVEYOR	2.5	4.1
			23.5

TOTAL MOTOR LOAD FOR MCP (MCP-2) = 23.5 FLA
WITH DESIGN CONTINGENCY = 29.4 FLA
MCP TRANSFORMER SIZE FOR PANEL + 15.6 FLA
TOTAL MCP LOAD = 45.0 FLA

TOTAL MCP LOAD IS FOR REFERENCE ONLY

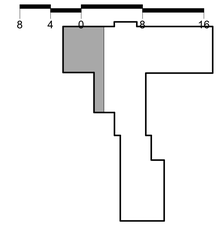
ELECTRICAL LOADS - MCP-3			
CONVEYOR ID	DESCRIPTION	HP	FLA
MF-01	TRANSPORT CONVEYOR	2	3.4
MF-01A	TRANSPORT CONVEYOR	2	3.4
MF-02	BREAKOVER	3	4.8
MF-03	BREAKOVER	2.5	4.1
MF-SD	SECURITY DOOR	2	3.4
MU1	MAKE-UP - INCLINE PLATE - STRAIGHT - MOTOR LOCATION	7.5	11
MU1	MAKE-UP - INCLINE PLATE - STRAIGHT - MOTOR LOCATION	7.5	11
			41.1

TOTAL MOTOR LOAD FOR MCP (MCP-3) = 41.1 FLA
WITH DESIGN CONTINGENCY = 51.4 FLA
MCP TRANSFORMER SIZE FOR PANEL + 15.6 FLA
TOTAL MCP LOAD = 67.0 FLA

TOTAL MCP LOAD IS FOR REFERENCE ONLY

BHS LEGEND - MCP ZONES

- MCP-1 (E) ZONE
- MCP-2 ZONE
- MCP-3 ZONE



KEY PLAN

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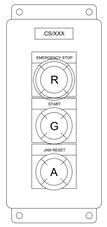
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SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - MCP ZONES & MCP LOADS

SHEET NO.:
QB-650

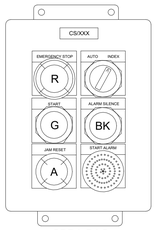
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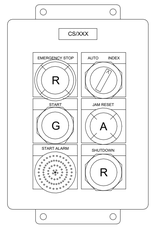
TRANSPORT CONVEYOR

1 C/S - TYPE 1
12" = 1'-0"



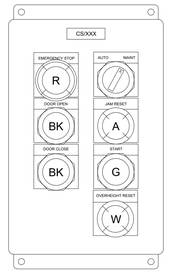
CBRA BAG
FEED LINE

5.2 C/S - TYPE 5
12" = 1'-0"



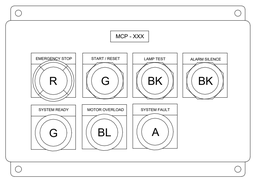
CBRA CLEAR LINE

7.2 C/S - TYPE 7
12" = 1'-0"



FIRE/SECURITY DOOR

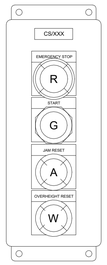
10 C/S - TYPE 10
12" = 1'-0"



MOTOR CONTROL PANEL

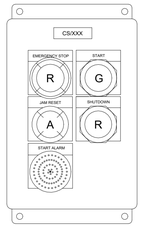
***BUTTONS CAN BE ATTACHED DIRECTLY TO THE MCP OR ON A NEW NEARBY CONTROL STATION AS SHOWN.**

12 C/S - TYPE 12
12" = 1'-0"



OVERHEIGHT

13 C/S - TYPE 13
12" = 1'-0"

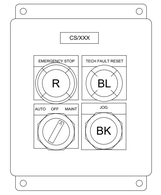


MAKE-UP USER INTERFACE

14 C/S - TYPE 14
12" = 1'-0"

MAKE-UP E-STOP/RESET

15 C/S - TYPE 15
12" = 1'-0"



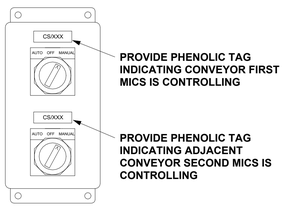
MAKE-UP MOTOR
CONTROL

16 C/S - TYPE 16
12" = 1'-0"



CROSS OVER

20 C/S - TYPE 20
12" = 1'-0"

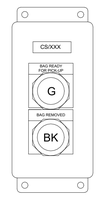


PROVIDE PHENOLIC TAG INDICATING CONVEYOR FIRST MICS IS CONTROLLING

PROVIDE PHENOLIC TAG INDICATING ADJACENT CONVEYOR SECOND MICS IS CONTROLLING

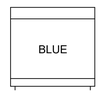
MANUAL INTERVENTION CONTROL STATION (MICS)

24 C/S - TYPE 24
12" = 1'-0"



OVERSIZE PICK-UP

29 C/S - TYPE 29
12" = 1'-0"



*MOUNT UP ABOVE
MU IN VIEW OF
AIRLINE EMPLOYEES*

OVERSIZE PICK-UP INDICATOR

30 C/S - TYPE 30
12" = 1'-0"

BHS LEGEND - CONTROLS

- ILLUMINATED LATCHED MUSHROOM STYLE PUSH / PULL TOP WITH LOCKING CAPABILITY
- FLAT PUSH BUTTON
- ILLUMINATED MOMENTARY PUSH BUTTON WITH PUSH LAMP TEST CAPABILITY
- ILLUMINATED LIGHT/LAMP
- SELECTOR SWITCH
- AUDIBLE ALARM
- KEYED SWITCH

G = GREEN	BK = BLACK
A = AMBER	BL = BLUE
R = RED	W = WHITE

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SAN LUIS OBISPO COUNTY REGIONAL AIRPORT
BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

ISSUED

	09/03/25	ISSUED FOR PERMIT
1	09/30/25	PERMIT REVISIONS

M&H NO.: 1943000-222814.02
DATE: January 28, 2026
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DRAWN BY: LP
CHECKED BY: KT
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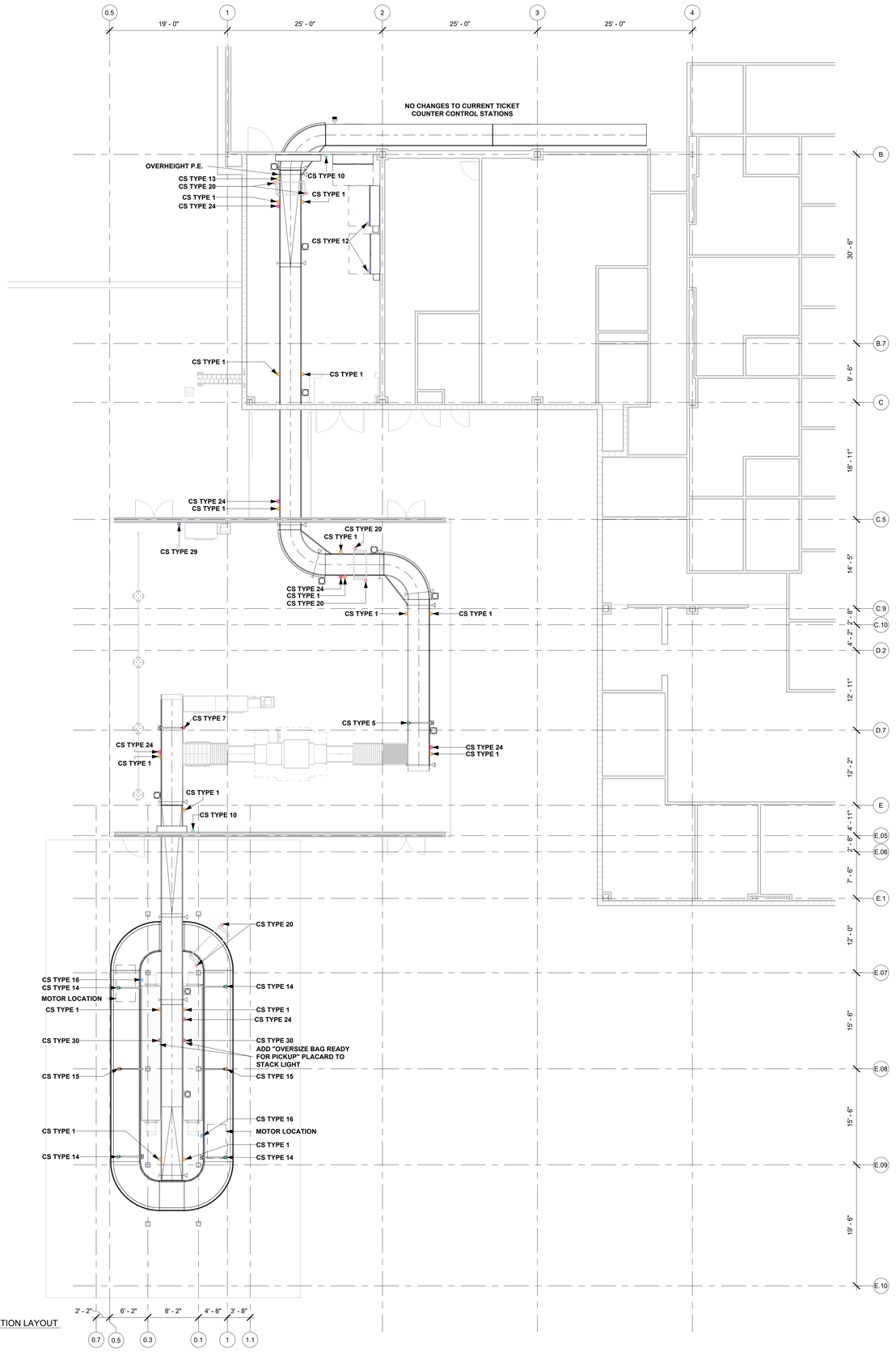
SHEET CONTENTS
TYPICAL DETAILS - CONTROL STATIONS

SHEET NO.:

QB-700

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1



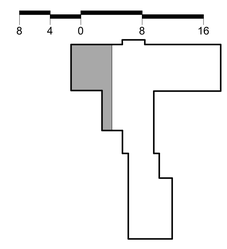
1 PLAN VIEW - FIRST FLOOR - PROPOSED - CONTROL STATION LAYOUT
1/8" = 1'-0"

NOTES:

- ELEVATIONS ARE REFERENCED ABOVE FINISHED FLOOR ELEVATION.
- BHS CONTRACTOR TO FIELD VERIFY ELEVATIONS, EXISTING CONDITIONS OF FLOOR FLATNESS AND FLOOR LEVELNESS PRIOR TO SHOP DRAWING DEVELOPMENT.
- SPEEDS ARE FOR REFERENCE ONLY.
- BHS CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF THE INTEGRATION REQUIREMENTS OF SYSTEMS IN THE PROPOSED DESIGNS. THIS INCLUDES, BUT NOT LIMITED TO ALL EXISTING SYSTEMS, FOR EXAMPLE, EDS MACHINES, ACCESS CONTROL DEVICES, FIRE MANAGEMENT SYSTEMS, ETC. VERIFICATION SHALL BE COMPLETED PRIOR TO SHOP DRAWINGS.
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- BHS CONTRACTOR TO PROVIDE AN HMI SCREEN AT ALL MCP CABINETS
- BHS CONTROL STATION BUTTON LAYOUT FOR REFERENCE ONLY. BHS CONTRACTOR SHALL SUBMIT PROPOSED CONTROL STATION LAYOUT AND FUNCTIONALLY FOR REVIEW AND APPROVAL FROM THE AIRPORT.
- CONTROL STATION IN PUBLIC AREA SHALL BE CLAD IN STAINLESS STEEL

BHS LEGEND - CONTROL STATION LEGEND

- TYPE 1 CONTROL STATION
- TYPE 5 CONTROL STATION
- TYPE 7 CONTROL STATION
- TYPE 10 CONTROL STATION
- TYPE 12 CONTROL STATION
- TYPE 13 CONTROL STATION
- TYPE 14 CONTROL STATION
- TYPE 15 CONTROL STATION
- TYPE 16 CONTROL STATION
- TYPE 20 CONTROL STATION
- TYPE 24 CONTROL STATION
- TYPE 29 CONTROL STATION
- TYPE 30 CONTROL STATION
- = PHOTO-EYE (PE)



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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

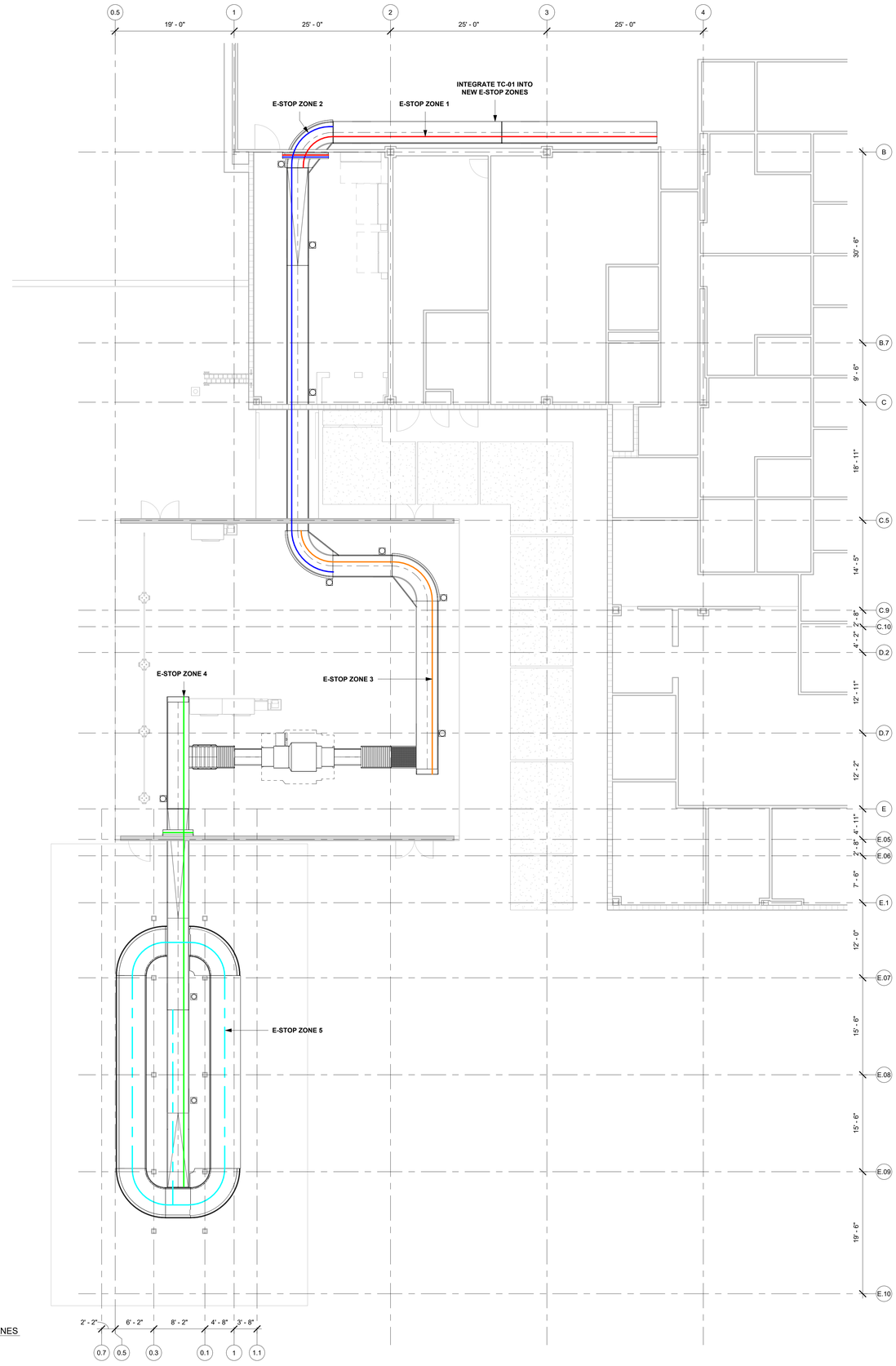
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SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - CONTROL STATION LAYOUT

SHEET NO.:
QB-701

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1 PLAN VIEW - FIRST FLOOR - PROPOSED -E-STOP ZONES
1/8" = 1'-0"

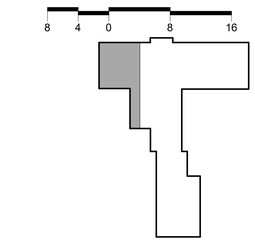
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- CONTROL STATION IN PUBLIC AREA SHALL BE CLAD IN STAINLESS STEEL

BHS LEGEND - E-STOP ZONES

- E-STOP ZONE 1
- E-STOP ZONE 2
- E-STOP ZONE 3
- E-STOP ZONE 4
- E-STOP ZONE 5

8 4 0 8 16



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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

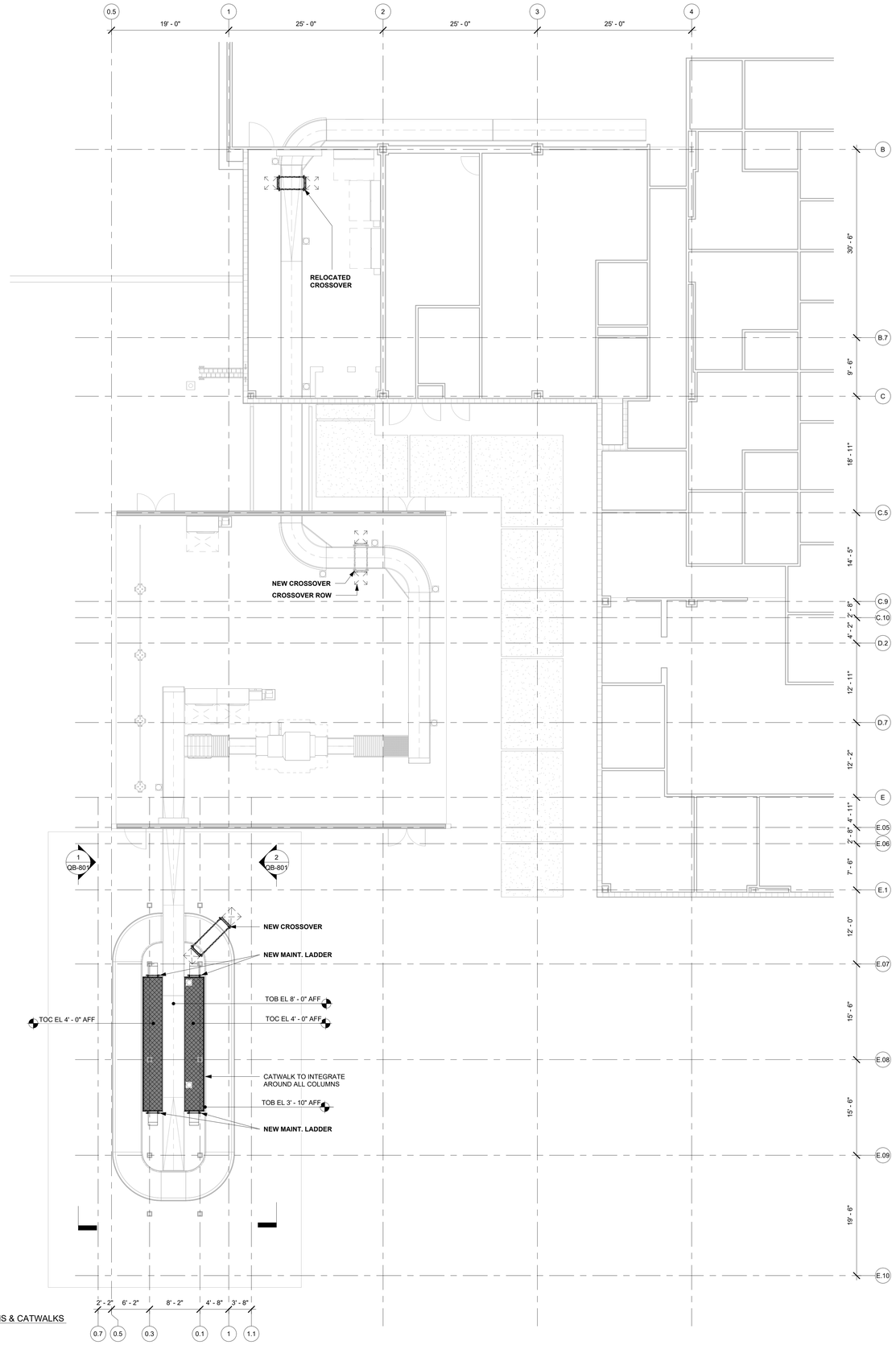
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SHEET CONTENTS:
PLAN VIEW - FIRST FLOOR - PROPOSED - E-STOP ZONES

SHEET NO.:
QB-750

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1 PLAN VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWALKS
1/8" = 1'-0"

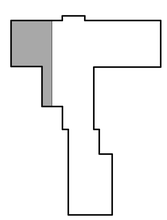
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BHS LEGEND - PLATFORMS & CATWALK

- PROPOSED
- PROPOSED CONVEYOR
- MAINT. ROW

8 4 0 8 16



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BAGGAGE SCREENING MODS.

975 AIRPORT DRIVE, SUITE 1
SAN LUIS OBISPO, CA 93401

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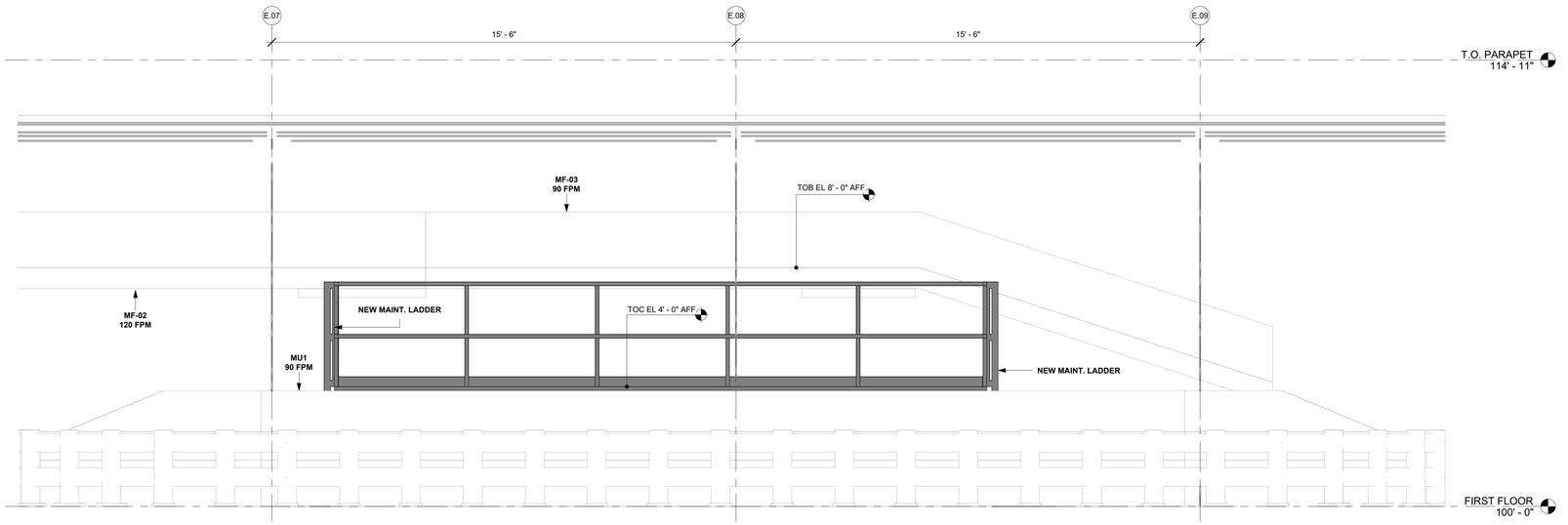
SHEET CONTENTS
PLAN VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWALKS

SHEET NO.:
QB-800

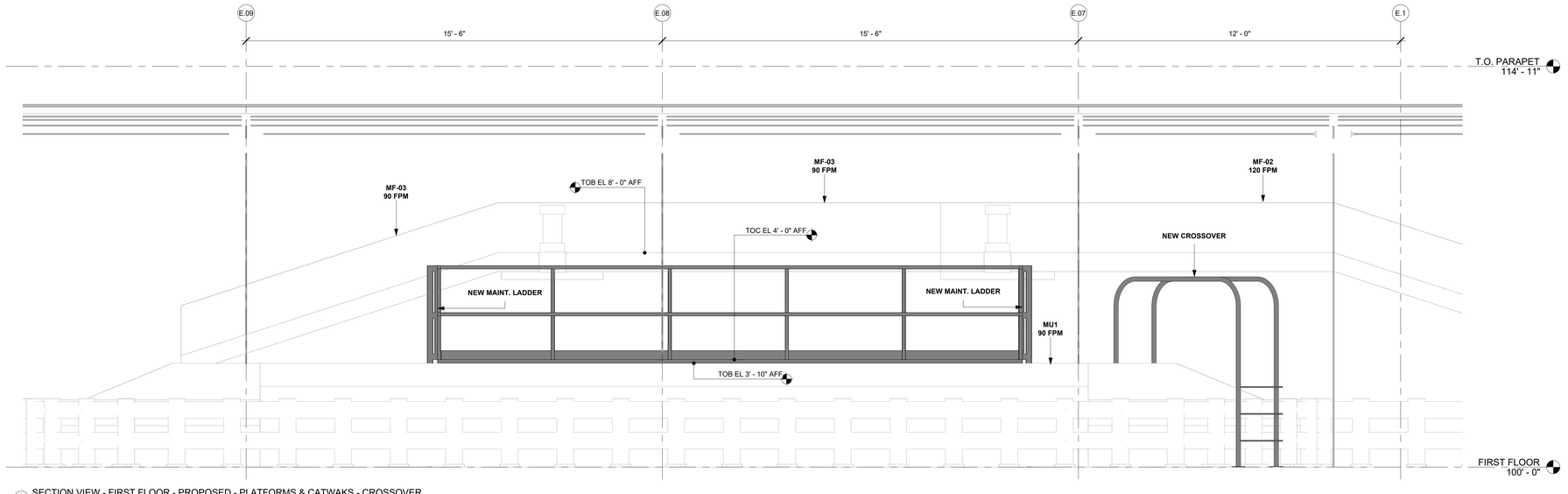
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1 SECTION VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWAKS
1/2" = 1'-0"

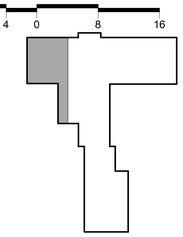


2 SECTION VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWAKS - CROSSOVER
1/2" = 1'-0"

BHS LEGEND - PLATFORMS & CATWALK

- PROPOSED
- PROPOSED CONVEYOR
- MAINT. ROW

8 4 0 8 16



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BAGGAGE SCREENING MODS.

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SHEET CONTENTS
SECTION VIEW - FIRST FLOOR - PROPOSED - PLATFORMS & CATWALKS

SHEET NO.:
QB-801

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