



TOWN OF MAMMOTH LAKES
437 OLD MAMMOTH ROAD, SUITE R
POST OFFICE BOX 1609, MAMMOTH LAKES, CA 93546
(760) 965-3600

PUBLIC WORKS DEPARTMENT

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

CONTRACT AND BID DOCUMENTS

FEDERAL PROJECT – AIP NO. 3-06-0146-0XX-2026



5-24-26

MAY 2026

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Soibian Spring
Airport Manager

MAY, 2026

TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT

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MULTIPURPOSE BUILDING
PHASE 2

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MAMMOTH YOSEMITE AIRPORT MULTIPURPOSE BUILDING PHASE 2

FEDERAL PROJECT – AIP NO. 3-06-0146-0XX-2026

ORGANIZATION OF SPECIFICATIONS

These specifications include the required F.A.A. General Provisions in Part I of the Special Provisions, which are taken from Advisory Circular 150/5370-10H, “Standards for Specifying Construction of Airports.” The Proposal and Contract Documents are included in the Contractual Documents of these specifications.

The FAA Technical Provisions of this specification are included in Part IV of the Special Provisions of these specifications and are based on Advisory Circular 150/5370-10H, “Standards for Specifying Construction of Airports.” Those sections of these standard specifications applicable to the project have been included.

The Building Package Provisions of this specification are included in Part V of the Special Provisions of these specifications and are based on the CSI MasterFormat Those sections of these standard specifications applicable to the project have been included.

An Airport Construction Safety and Phasing Plan (CSPP) has been prepared to outline all safety issues related to the proposed construction. This CSPP is included in these specifications as Appendix C. The Contractor will be required to submit all reports designated in the CSPP and implement all safety measures set forth in this plan.

The Contractor is responsible for all Quality Control (QC) during the construction of this project, including testing and inspection. A Construction Management Plan has been prepared and is included in Appendix D of these specifications. This plan outlines how this project will be managed during construction and includes construction management personnel and resumes, inspection procedures and frequencies, submittal process, quality control testing, quality assurance testing, and test result documentation.

A Geotechnical Investigation and Report was conducted by the office of Brandley Engineering for the 7-Bay ARFF/Snow Removal Facility in 2022 (Revised in 2023) and is included in Appendix E of these specifications.

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Contractual Provisions

TOWN OF MAMMOTH LAKES, CA

PUBLIC WORKS DEPARTMENT

NOTICE INVITING BIDS

**AIP NO. 3-06-0146-0XX-2026
MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING – PHASE 2**

Sealed proposals for the work shown on the plans entitled:

**Construction Plans for
Mammoth Yosemite Airport
Multipurpose Building – Phase 2**

in

The Town of Mammoth Lakes, California

Bids will be received through the Town's eProcurement Portal at:

[Online Bid Portal
https://www.townofmammothlakes.ca.gov/1016/Bids](https://www.townofmammothlakes.ca.gov/1016/Bids)

until **3:00 pm PT on Wednesday July 8, 2026**, at which time they will be publicly opened and read. Contractors can attend the bid opening by Zoom (**information will be posted on the Online Bid Portal page**).

Proposal forms for this work are included in a separate book entitled:

**Contract and Bid Documents for Mammoth Yosemite Airport
Multipurpose Building – Phase 2
In
The Town of Mammoth Lakes, California**

Each bidder must supply all the information required by the bid documents and specifications.

GENERAL DESCRIPTION:

The project generally consists of the following work:

- Construction work for Multipurpose Building to Include SRE Components including grading, drainage, paving of the access road and apron, hardscapes, marking, fencing, building and building foundations and floor slabs and building interior and exterior utilities.

This project will be partially funded by the Airport Improvement Program of the Federal Aviation Administration (F.A.A.).

The Engineer's Estimate will be made public at the Bid Opening.

OBTAINING PLANS AND SPECIFICATIONS:

Plans and specifications can be obtained from the [Online Bid Portal \(https://www.townofmammothlakes.ca.gov/1016/Bids\)](https://www.townofmammothlakes.ca.gov/1016/Bids).

Questions or requests for clarifications should be submitted through the [Online Bid Portal](https://www.townofmammothlakes.ca.gov/1016/Bids) under the project's Question and Answer section. The contact is Soibian Spring, Airport Manager, Mammoth Yosemite Airport, via email sspring@townofmammothlakes.ca.gov or 760-914-0065. Oral clarifications are non-binding, and any changes shall be issued by written addenda only.

CONTRACT TIME:

This work shall be constructed in accordance with details as shown on the plans and described in the specifications for this project. The contractor will be allowed one hundred fifteen (115) working days to complete the project.

BIDDER'S BOND:

Each bid must be accompanied by a certified or cashier's check payable to the order of the Town of Mammoth Lakes, or by a bid bond executed by a corporate surety authorized to do business in the State of California in the sum of not less than 10% of the total amount of the bid, as a guarantee that the bidder will enter into the proposed contract if it be awarded him/her.

CONTRACTOR QUALIFICATIONS:

The contractor shall have a valid Class B Contractor's license, a current Town of Mammoth Lakes Business Tax Certificate, and shall maintain all required licenses throughout the duration of the Contract. The contractor shall demonstrate their qualifications by having adequate equipment in good working order, experience, and ability to perform the work.

AWARD OF CONTRACT:

The contract will be awarded on the basis of UNIT BID price and will provide for progressive payments and liquidated damages as fixed in the specifications. All proposals must be made on the forms as contained in the specifications for the previously described project and shall in all respects comply with the Instructions to Bidders and Contract Documents. Bids must be in writing and signed by or on behalf of the bidder.

The award of this project is contingent upon a grant offer from the Federal Aviation Administration and acceptance of the grant offer by the Town of Mammoth Lakes. Each bid shall remain good for a minimum of ninety five (95) days.

BONDING REQUIREMENTS:

The successful bidder shall furnish a payment bond and a performance bond for 100 percent of the contract price to secure fulfillment of all the bidder's obligations under such contract and to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract. All bonds shall be executed by an admitted surety insurer meeting the requirements of California Code of Civil Procedure Section 995.120.

FEDERAL PROVISIONS:

The work to be done is being financed in whole or in part by means of a grant made by the United States acting through the Federal Aviation Administration of the Department of Transportation. This project is subject to the Federal provisions, statutes and regulations as set forth in the project specifications.

This project is under and subject to the Federal Fair Labor Standards Act and Wage Rate Decision contained in the contract documents.

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

Title IV – Civil Rights Act - As a condition of a grant award, the Sponsor shall demonstrate that it complies with the provisions of Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq) and implementing regulations (49 CFR part 21) including amendments thereto, the Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123), the Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.), Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 et seq.), the Americans with Disabilities Act of 1990 (42 U.S.C. § 12101, et seq.), U.S. Department of Transportation and Federal Aviation Administration (FAA) Assurances, and other relevant civil rights statutes, regulations, or authorities, including any amendments or updates thereto. This may include, as applicable, providing a current Title VI Program Plan to the FAA for approval, in the format and according to the timeline required by the FAA, and other information about the communities that will be benefited and impacted by the project. A completed FAA Title VI Pre-Grant Award Checklist is required for every grant application, unless excused by the FAA. The Sponsor shall affirmatively ensure that when carrying out any project supported by this grant that it complies with all federal nondiscrimination and civil rights laws based on race, color, national origin, sex, creed, age, disability, genetic information, in consideration for federal financial assistance. The Department's and FAA's Office of Civil Rights may provide resources and technical assistance to recipients to ensure full and sustainable compliance with Federal civil rights requirements. Failure to comply with civil rights requirements will be considered a violation of the agreement or contract and be subject to any enforcement action as authorized by law.

SMALL BUSINESS PARTICIPATION:

The Sponsor has established a Small Business Element in accordance with 49 CFR Part 26 to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation and to create a level playing field on which small businesses can compete fairly. While there is no specific numerical goal assigned to small business participation the prime contractor should make every effort to solicit small business concerns (as defined in 13 CFR Part 121) to participate as subcontractors, service providers, suppliers, etc.

The Bidder must submit the Small Business Participation information with its proposal on the forms provided herein (Fostering Small Business Participation & Non-Certified Small Business Verification Form).

SOCIALLY/ECONOMICALLY DISADVANTAGED FINANCIAL INSTITUTIONS:

The Sponsor encourages Contractors and Subcontractors to utilize the services of financial institutions owned and controlled by socially and economically disadvantaged individuals in the community. You can find a link to Minority-Owned Financial Institutions and their branches on the FDIC website: <https://www.fdic.gov/regulations/resources/minority/mdi.html> or the U. S. Department of Treasury – Bureau of the Fiscal Service <https://fiscal.treasury.gov/mbdpl/>.

CARB CONTRACTING REQUIREMENTS:

The California Air Resources Board (“CARB”) implemented amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulations (“Regulation”) which are effective 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/sites/default/files/barcu/regact/2022/off-road-diesel/appa-1.pdf>. 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. Bidders must provide, with their Bid, copies of Bidder's and all listed subcontractors' most recent, valid Certificate of Reported Compliance (“CRC”) issued by CARB. Failure to provide valid CRCs as required herein may render the Bid non-responsive.

WAGE REQUIREMENTS:

Pursuant to Section 1770, and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are on file at the Town of Mammoth Lakes Public Works Department, which copies shall be made available to any interested party on request.

All labor on the project shall be paid the higher of the minimum wage rates as established by the U.S. Secretary of Labor, or the California Director of Industrial Relations. If a discrepancy exists between these two determinations, then all labor on the project shall be paid the higher of the two minimum wage rates.

DIR Registration: In accordance with Senate Bill 854 (SB 854) and Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. If awarded a Contract, the Bidder and its subcontractors, of any tier, shall maintain active registration with the Department of Industrial Relations for the duration of the Project.

PRE-BID CONFERENCE:

A non-mandatory pre-bid meeting will be held via zoom on **Wednesday, June 10, 2026, at 1:00 P.M.** Contractors may attend in person or may participate virtually. **Information will be posted on the Online Bid Portal page.** For those who can attend in person, a site walk will be conducted after the pre-bid meeting. For those attending virtually, a separate site visit by appointment only may be arranged by contacting Soibian Spring sspring@townofmammothlakes.ca.gov.

RETAINAGE FROM PAYMENTS:

Monthly progress payments shall be made to the Contractor for the value of the work completed during the preceding month, less a five percent (5%) security withhold pursuant to Public Contract Code Section 7201.

Pursuant to Government Code Section 4590, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Town or with a state or federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the contract. Securities eligible for investment under this section shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

The Town of Mammoth Lakes reserves the right to reject any and/or all bids or to utilize any alternative procedures authorized by the Public Contracts Codes Sections 20166 and 20167 and accept such bids as are to the best interest of the Town. The Town reserves the right to waive any informality, or irregularity in a bid.

TOWN OF MAMMOTH LAKES, CALIFORNIA

TOWN CLERK: Jamie Gray DATED: _____

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

INSTRUCTIONS TO BIDDERS

Notice is hereby given that sealed bids will be received by the Office of the Town Clerk of the Town of Mammoth Lakes, at the time and manner set forth in the Notice Inviting Bids for the furnishing of all required tax, labor, material, transportation, and equipment necessary for the construction of all work covered by AIP Project No. 3-06-0146-0XX, Multipurpose Building – Phase 2, Mammoth Yosemite Airport, Mammoth Lakes, Mono County, California, all in accordance with the plans and specifications on file with the Town of Mammoth Lakes, Public Works Department, to which bidders are particularly referred.

Immediately after the time set for opening of bids, the proposals will be publicly opened and read at the Office of the Town Clerk of the Town of Mammoth Lakes, and will be referred to and considered by the Town Council at its regular meeting. Contractors can attend the bid opening by Zoom (**information will be posted on the Online Bid Portal page**). Any bid received after the time specified will be returned to the bidder unopened.

1. SCOPE OF PROJECT

The work to be done under this contract consists of furnishing all materials, plant and equipment, and performing all necessary labor in accordance with the prepared plans, specifications, and special provisions as directed by the Town or its authorized representative, as follows:

- Construction work for Multipurpose Building to Include SRE Components including grading, drainage, paving of the access road and apron, hardscapes, marking, fencing, building and building foundations and floor slabs and building interior and exterior utilities.

2. PREPARATION OF BID

Bids will be received through the Town's eProcurement Portal at:

[Online Bid Portal
https://www.townofmammothlakes.ca.gov/1016/Bids](https://www.townofmammothlakes.ca.gov/1016/Bids)

All blank spaces for bid prices must be filled in. There is a bid form that is electronic on the project website under Project Documents Section 4, Bid Form. The electronic bid form under Project Documents Section 4, Bid Form must be used in addition to Pages A1 thru A29 in the Proposal and Contract Document.

3. LOCAL CONDITIONS

Bidders are notified that they must carefully examine the Plans and Specifications, annexed forms of Proposal, General Conditions, and Contract and thoroughly familiarize themselves with all State and other laws pertaining to this improvement. They must also examine and judge for themselves as to the location and character of the proposed work, the amounts and quality of the materials to be required, the work to be done, and other features to be encountered. No allowance will be made to any bidder because of lack of such examination or knowledge.

If any bidder is in doubt as to the true meaning of any part of the drawings, specifications, or other Contract Documents, or finds discrepancies in, or omissions from, the drawings or specifications, he/she may submit questions or requests for clarifications through the [Online Bid Portal](https://www.townofmammothlakes.ca.gov/1016/Bids) under the project's Question and Answer section. The contact is Soibian Spring, Airport Manager, Mammoth Yosemite Airport, via email sspring@townofmammothlakes.ca.gov. Oral clarifications are non-binding and any changes shall be

issued by written addenda only. The Town will not be responsible for any other explanation or interpretation of the Contract Documents.

Any addenda issued before the time in which to submit bids expires shall form a part of the Contract Documents and shall be covered in the bid. Each bidder shall confirm receipt of any and all addenda in the space provided in Paragraph 1 of the Proposal.

No person, firm, or corporation shall be allowed to make or file or be interested in more than one bid for the same work, unless alternate bids are called for.

4. EXISTING FACILITIES

The Contractor's attention is directed to the fact that the existing airport facilities must be kept in operation with an absolute minimum of interference, except as specified in the Special Conditions section of these specifications, in order that no delays or hazards affect the using of this airport facility. The Contractor shall be required to plan and coordinate his/her work with the Resident Project Representative (RPR) in such a manner as to ensure safety and a minimum of hindrance to the public using the facilities. All construction and access to the construction must be confined to the limits designated by the RPR.

5. ESTIMATE OF QUANTITIES

The estimate of quantities of work to be done under the specifications is approximate and is given only as a basis of calculation upon which the award of the contract will be made. The Contractor will be paid for the actual work done including materials and equipment actually installed at the contract unit price. The Owner reserves the right to increase or decrease the amount of any class of work or material deemed necessary without restrictions. Bidders must submit balanced bids in order that they may not be affected adversely by an increase or decrease of quantities.

6. BIDDER'S QUALIFICATIONS

The contractor shall have a valid Class B Contractor's license, a current Town of Mammoth Lakes Business Tax Certificate, and shall maintain all required licenses throughout the duration of the Contract. The contractor shall demonstrate their qualifications by having adequate equipment in good working order, experience, and ability to perform the work.

In accordance with Senate Bill 854 (SB 854), all contractors submitting a bid for this project must be registered with the Department of Industrial Relations (DIR). All contractors and subcontractors who bid and work on any Town-awarded public works project must be registered.

7. SUBLETTING OF CONTRACT

The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of his right, title, or interest therein, without written consent of the Owner. In case such consent is given, the Contractor will be permitted to sublet a portion thereof, but shall perform with his own organization not less than 30 percent of the total contract cost, except that any items designated by the Contractor and approved by the Owner as "specialty items" may be performed by subcontract and the cost of any such specialty items so performed by subcontract may be deducted from the total cost before computing the amount of work to be performed by the Contractor with his own organization. No subcontracts or transfer of contract shall release the Contractor of his liability under contracts and bonds.

8. CALIFORNIA AIR RESOURCES BOARD ("CARB") REGULATIONS

The Town is a Public Works Awarding Body, as defined under Title 13 California Code of Regulations section 2449(c)(46). Accordingly, Bidders must submit, with their Bids, valid Certificates of Reported Compliance ("CRC") for the Bidder's fleet and for the fleet(s) of its listed subcontractors (including any applicable leased equipment or vehicles). Bidder must additionally complete and submit the Fleet Compliance Certification,

included in the Bid Documents. Failure to provide a CRC for the Bidder, and for all listed subcontractors, or failure to complete the Fleet Compliance Certification, may render the Bid non-responsive.

9. IDENTIFICATION OF SUBCONTRACTOR BY BIDDERS

The Bidder shall include in his proposal for the work the name, location of the place of business, and California Contractor's license number of each subcontractor who will perform work or labor or render service to the general contractor in or about the construction of the work or improvement in an amount in excess of one-half (1/2) of one percent (1%) of the general contractor's total bid, and the portion of the work which will be done by each subcontractor.

10. FORM OF PROPOSAL

All proposals must be submitted on the form furnished herewith and bound herein, and in addition to the necessary unit price items to make a complete bid, all blanks giving general information must be filled in and the bid signed by the Contractor or his duly authorized agent.

Proposals for the project described in Paragraph 1 of this section must be submitted through the Town's eProcurement Portal as set forth in the Notice Inviting Bids and must be on file prior to the time of opening of bids.

Each bid must be accompanied by an acceptable Bid Bond to the Town of Mammoth Lakes, in the amount of at least ten percent (10%) of the total amount of the bid for construction cost. Such bond shall be forfeited and become the property of the Town of Mammoth Lakes if the bidder fails or refuses to enter into a contract and furnish satisfactory bonds within fifteen (15) calendar days after due notification that his bid has been accepted. The bond accompanying the accepted bid will be retained until the contract documents have been signed by the successful bidder and approved by the Town of Mammoth Lakes and the Federal Aviation Administration.

All bidders must submit with their bids a list of their proposed subcontractors in compliance with Sections 4100-4113 of the Government Code of the State of California. Forms for this designation are furnished in the Proposal and Contract Documents.

The proposals may be rejected if they show any alteration of forms, additions not called for, conditional or alternative bids, incomplete bids, erasures or irregularities of any kind.

The Town of Mammoth Lakes reserves the right to retain the bonds of the two lowest bidders until an approved contract has been signed. All other bidders' bonds will be returned by the Town of Mammoth Lakes.

11. BASIS OF AWARD

The contract, if awarded, will be awarded to the lowest responsive and responsible bidder who is in compliance with these instructions and the Advertised Notice Inviting Bids, provided the bids are reasonable and it is to the interest of the Owner to accept them. If the bid form contains additive and/or deductive alternates, the Owner, for cost considerations, may select additive and/or deductive alternates before determining the lower bidder. The competency and the responsibility of bidders and of their proposed subcontractors will be considered in making the award of the bid. The Owner reserves the right to reject any or all bids, to waive irregularities not affecting substantial rights, and to delay the award pending approval of the Federal Aviation Administration.

The award of this project is contingent upon a grant offer from the Federal Aviation Administration and acceptance of the grant offer by the Town of Mammoth Lakes.

In case of conflict in the proposal between unit price bid and the extended total, the unit price bid shall govern. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The basis of the award is subject to all conditions as contained in these specifications. It is understood and agreed that all equipment and material items shall be in stockpile under immediate control of the Contractor prior to the time they will be needed to complete the work at the Airport.

The contract award will be made within ninety five (95) calendar days after the date set for the opening of the bids. The Contractor shall commence work within ten (10) calendar days after the date set by the Town of Mammoth Lakes in the written Notice to Proceed to the Contractor.

The project is partially funded by a grant from the Federal Aviation Administration under the Airport Improvement Program (AIP). The grant is anticipated by late-summer. The Notice to Proceed on this project cannot be prepared until the FAA grant has been obtained. Once the Notice to Proceed has been issued, the Contractor will have **115 working days** for completion of the project. Due to typical winter weather conditions, construction cannot take place between October 15 and approximately May 15 (exact spring date is dependent on spring snow melt).

12. CONTRACT BONDS

Upon receipt of written notice of award of the contract and not more than ten (10) days thereafter, the Contractor shall furnish the following bonds with power of attorney issued by a surety licensed to do business in the State of California. The form of the bonds shall be acceptable to the Owner:

- a. Faithful Performance Bond in a sum equal to one hundred percent (100%) of the amount of the contract awarded. This bond shall be made payable to the Town of Mammoth Lakes to guarantee the faithful performance of the contract.
- b. Payment Bond in a sum equal to one hundred percent (100%) of the amount of the contract awarded. This bond shall be made payable to the Town of Mammoth Lakes to guarantee the payment of all labor, materials, rentals, etc. This bond shall have specific provisions to assure payment of all unemployment contributions which become due and payable.

13. WORKER'S COMPENSATION INSURANCE

The Contractor shall provide worker's compensation insurance, as required under the laws of the State of California, protecting the employees on the work, and shall pay all premiums due thereunder.

14. PUBLIC LIABILITY INSURANCE

See Special Provisions Part I, FAA General Contract Provisions, Article 70-21 for insurance requirements.

15. CONTRACT TIME

The Contractor shall begin work within ten (10) calendar days after the date set in the written Notice to Proceed by the Owner and shall diligently prosecute same to completion for all of the proposed construction.

The Contract time for the completion of the total project shall begin on date of written Notice to Proceed. The contractor will be allowed one hundred fifteen (115) working days for construction of the project.

16. LIQUIDATED DAMAGES

If the Contractor refuses or fails to complete the work within the time specified, including authorized extensions, there shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages the sum of Three Thousand Dollars (\$3,000.00) for each calendar day subsequent to the time specified and the time the work is actually completed and accepted. Delays caused by adverse weather conditions or conditions for which the Owner is clearly responsible will be added to the contract time.

17. SHOP AND MANUFACTURER'S DRAWINGS

The successful bidder shall submit to the RPR electronic copies of the name of manufacturers, catalog numbers, and shop drawings of each item of equipment he proposes to furnish and install under this contract. These submittals shall be made to the RPR prior to or at the Preconstruction Conference.

18. FEDERAL REQUIREMENTS

The work done under this contract is being financed in part by a grant from the U.S. Government under the Airport Improvement Program. The Federal Requirements included in Attachment 1 to the Contract, Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects, must be adhered to by the Contractor:

19. DEPARTMENT OF LABOR POSTERS

U.S. Department of Labor Posters, Form SOL-155 (10-54), together with the applicable minimum wage rates, as determined by the Secretary of Labor for this project, shall be posted in a prominent place at the site of the work. The name of the FAA District Airport Engineer whom workers may contact in the event they have reason for complaint shall be placed in the box in the middle of the poster. Copies of this poster can be obtained from local Labor Department offices.

20. PAYMENTS

Progress payments shall be made at least once each month as the work progresses. These progress payments shall be based on work accomplished during the previous working month, based on the various contract bid items and the unit bid prices included in the Bid Schedule submitted by the Contractor with his/her bid. In applying for payments, the Contractor shall submit a statement based on this schedule. Payment will be made only for material and work actually incorporated in the work, except as allowed in Article 90-07, Payment for Materials on Hand, of the F.A.A. General Contract Provisions.

21. INVOICING AND PAYMENT MONITORING

Progress payments are made in accordance with Section 20 of this document and are proactively monitored to ensure compliance with local, state, and federal Prompt Payment requirements. Each payment application will include a list of all subcontractors and the amount to be paid to the subcontractors from the pay application. With the exception of the initial payment application each subsequent payment application must be submitted with prime contractor prompt payment certification to be deemed complete, accurate, and acceptable. A suggested form for the Payment Application and Prime Contractor Prompt Payment Certification follow on the next pages.

Prime Contractor												
Firm Name:	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No											
Firm Address:							City:		State:		Zip Code:	
Contact Name:							Email Address			Phone:		
Payment Request Information												
Project #:										Billing Period (MM/DD/YYYY-MM/DD/YYYY):		
Application #:										Contract Date:		
Application for Payment												
Item #	Description*	Unit	Unit Price	Bid Quantity	Bid Amount	Quantity Complete	Amount Due					
1.	Total Original Contract Amount				\$ -	0.00	\$ -					
2.	Net Approved Change Orders						\$ -					
3.	Adjusted Contract Amount (line 1 +/- line 2)						\$ -					
4.	Total Value of Work Completed & Materials Stored on Site to Date						\$ -					
5.	Amount Retained (line 4 x % retained)				0%		\$ -					
6.	Total Amount Earned (line 4 - line 5)						\$ -					
7.	Total Amount Received to Date						\$ -					
8.	Current Payment Due (line 6 - line 7)						\$ -					
9.	Balance to Finish Including Retainage (line 3 - line 6)						\$ -					
Subcontractors/Subconsultants to be Paid from this Payment Application												
Subcontractor/Sub consultant Name							Amount Due					
							\$ -					
							\$ -					
							\$ -					
							\$ -					
							\$ -					
							\$ -					
							\$ -					
							\$ -					
							\$ -					
Certification												
By signing this document the applicant for payment certifies to the best of their knowledge that the information presented above is true and accurate. All work attributable to this Payment Application has been performed in a satisfactory manner. All previous payments received by the applicant were properly disbursed if required. As a result of performance in accordance with the terms of the contract documents, payment is due to the applicant as describe above.												
Signature _____				Company Name: _____								
Print Name: _____				Date: _____								
Title _____												
To be considered complete, this Payment Application (excluding the initial Payment Application) should be submitted with the Prime Contractor Prompt Payment Certification documenting all subcontractor payments. Following final payments to subcontractors the a final Prime Contractor Prompt Payment Certification will be submitted to document project completion.												
Reviewer Certification (For use by Sponsor Only)												
This Pay Application has been reviewed and is deemed accurate and complete.												
Signature _____				Company Name: _____								
Print Name: _____				Date: _____								
Title _____												

PRIME CONTRACTOR PROMPT PAYMENT CERTIFICATION

In accordance with 49 CFR §26.29(a), the Sponsor requires prime contractors to pay subcontractors for satisfactory performance of their contracts no later than 10 days from the prime contractor's receipt of each payment from the Sponsor. Any delay or postponement of payment among the parties may take place only for good cause with the Sponsor's prior written approval. This requirement applies to both DBE and non-DBE subcontractors. List all subcontractors/subconsultants. If the actual DBE utilization was different than that approved at the time of award, provide comments.

Prime Contractor/Consultant	Project Number	Total Contract Amount (\$)	Total DBE Commitment Amount (\$)	DBE Commitment (%)	DBE Accomplishment %	Billing Period (MM/DD/YYYY - MM/DD/YYYY)
		\$ -	\$ -	0%	0%	

DBE Subcontractor/Subconsultant Information										
DBE Subcontractor/Subconsultant Name	Date Payment Received by Prime	Date of Prime Payment to Sub	Amount of Payment	Amount Paid to Sub to Date	Total Committed to this Subcontractor	Promptly Paid? (Y/N)	Incremental Retainage Paid? (Y/N or N/A)	% Applicable to DBE Goal (100%, 60%, 40%)	Dollars Applicable to DBE Goal	Comments or Reason for Non-Prompt Payment including Payment of Incremental Retainage
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
			\$ -	\$ -	\$ -				\$ -	
Totals			\$ -	\$ -	\$ -				\$ -	

Non-DBE Subcontractor/Subconsultant Information										
Subcontractor/Subconsultant Name	Date Payment Received by Prime	Date of Prime Payment to Sub	Amount of Payment	Amount Paid to Sub to Date	Total Committed to this Subcontractor	Promptly Paid? (Y/N)	Incremental Retainage Paid? (Y/N or N/A)	Comments or Reason for Non-Prompt Payment including Payment of Incremental Retainage		
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
			\$ -	\$ -	\$ -					
Totals			\$ -	\$ -	\$ -					

Certification	
<p>The prime contractor or consultant hereby certifies that the foregoing Prompt Payment Certification is true and correct. Documents of these payments are available for inspection upon request.</p> <p>Signature: _____</p> <p>Print Name: _____</p> <p>Title: _____</p> <p>Company Name: _____</p> <p>Date: _____</p>	<p>The Sponsor certifies that all information in this form is complete and verified.</p> <p>Signature: _____</p> <p>Print Name: _____</p> <p>Title: _____</p> <p>Company Name: _____</p> <p>Date: _____</p>

22. WITHHOLDING

Owner shall withhold from each payment due the Contractor five percent (5%) of the amount claimed. This 5% of the payment shall be withheld until final acceptance of the total project is given by the Owner, by the Engineer, and by the FAA. After final acceptance of the project is given and the Contractor has submitted acceptable release of all liens and furnished the Engineer acceptable red-lined drawings showing the "as-built" condition of the completed project and all other applicable documents listed in Article 90-11, Contractor Final Project Documentation, then the Owner shall release for payment the 5% retention. Owner will make such final payment of retention within thirty-five (35) days of final acceptance of the project and submittal of all Contractor Final Project Documentation.

Pursuant to Government Code Section 4590, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Town or with a state or federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the contract.

Securities eligible for investment under this section shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit.

The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

23. DEFINITIONS

Whenever in the specifications or on the drawings the word directed, required, permitted, designated, ordered, or words of like import are used, it shall be understood that the direction, requirement, permission, designation or order of the Town of Mammoth Lakes is intended; and, similarly, the words approved, satisfactory, suitable, acceptable, or words of like import, shall mean approved by the representative of the Town of Mammoth Lakes authorized to express such approval.

24. WAGE RATES

All labor on the project shall be paid no less than the minimum wage rates as established by the U.S. Secretary of Labor. Further, pursuant to California Labor Code Section 1770, the California Director of Industrial Relations has specified the general prevailing wage rates for all public projects in California. The wages to be paid to all workers on such projects shall not be less than those specified in such wage rate determination. The higher of the two rates shall be paid.

The wage rates specified by the U.S. Secretary of Labor are included in Attachment 2 to the Agreement in these specifications and the prevailing wage rates as determined by the California Director of Industrial Relations are available from the Town of Mammoth Lakes Public Works Department.

25. TAXES

Bidders shall have included in their bids any and all Federal, State and local taxes of whatever nature in connection with material to be furnished to the Town. Absolutely no extras shall be allowed for such by the Town. The successful bidder will be required to obtain a Business Tax Certificate from the Town of Mammoth Lakes prior to commencing work under a contract with the Town. Failure to obtain the Tax Certificate within fifteen (15) days of the AWARD OF CONTRACT will be cause for termination of the Contract or the contract process if not yet fully executed.

26. CONTRACT DOCUMENTS

The form of agreement which the successful bidder, as Contractor, will be required to execute and the form of bonds which he will be required to furnish are included in the Contract Documents and should be carefully examined by each bidder. The agreement and bonds will be executed in two (2) original counterparts. The

complete contract consists of the Proposal and Contract Documents as defined in the agreement and are intended to cooperate and be complementary so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents. The intention of the documents is to include all labor, materials, equipment, transportation and services necessary for the proper execution of the work.

27. DECLARATION FOR FINAL PAYMENT

After the completion of the work of this contract, the Contractor shall file with the Town his declaration under penalty of perjury stating that all workers and persons employed, all firms supplying the materials and all subcontractors upon the project, have been paid in full and that there are no bills outstanding against the project for either labor or materials except certain items, if any, to be set forth in detail in the declaration. The filing of such declaration by the Contractor and the submittals referred to in Section 90-11 of Part I of the Special Provisions shall be a condition precedent to Contractor's receipt of the final payment on this contract.

28. ADMONITION

All bidders hereby are advised that the Town of Mammoth Lakes has adopted Special Provisions for this work which differ substantially from the general provisions provided for private projects or projects undertaken by other governmental agencies. Contractors are admonished to carefully read the Special Provisions, as well as the special conditions and technical provisions, and are advised that the Special Provisions shall be enforced strictly.

29. SMALL BUSINESS PARTICIPATION

The Sponsor has established a Small Business Element in accordance with 49 CFR Part 26 to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation and to create a level playing field on which small businesses can compete fairly. While there is no specific numerical goal assigned to small business participation the prime contractor should make every effort to solicit small business concerns (as defined in 13 CFR Part 121) to participate as subcontractors, service providers, suppliers, etc.

The Sponsor has identified work categories conducive to small business participation on the form entitled Fostering Small Business Participation – List Defining Work Categories Conducive to Small Business Participation. Prime contractors are encouraged to solicit small business participation for the work items referenced.

The Bidder must submit the Small Business Participation information with its proposal on the forms provided herein (Fostering Small Business Participation & Non-Certified Small Business Verification Form).

FOSTERING SMALL BUSINESS PARTICIPATION - LIST DEFINING WORK CATEGORIES CONDUCTIVE TO SMALL BUSINESS PARTICIPATION

Background 49 CFR §23.26 and §26.39		
<p>The Sponsor has established a Small Business Element in accordance with 49 CFR Part 23 and 26 to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation and to create a level playing field on which small businesses can compete fairly. While there is no specific numerical goal assigned to small business participation the prime contractor/concessionaire should make every effort to solicit small business concerns (as defined in 13 CFR Part 121 or 49 CFR Part 23.33).</p> <p>The Sponsor has identified the below work categories that are conducive to small business participation for the referenced project. As per the agreement, prime contractors are <u>encouraged</u> to solicit small business participation for the work items referenced below.</p>		
Project Information		
Project #:	Project Name/Description: Mammoth Yosemite Airport - Multipurpose Building - Site Work Phase 2	
Identified Work Categories Conducive to Small Business		
Work Category/Bid Line Item	NAICS Code	Estimated Total Cost of Work
Airfield Marking including Surface Preparation & Reflective Media	237310	\$ -
Drainage Items	237310	\$ -
Electrical Items	23710	\$ -
		\$ -
		\$ -
		\$ -
		\$ -
		\$ -
		\$ -
Signature of Consulting Engineer (if applicable)		
Signature: _____	Company Name: <u>Brandley Engineering, Inc.</u>	
Print Name: <u>Melissa S. Brandley, P.E.</u>	Date: _____	
Title: <u>Project Manager/Principal Engineer</u>		
Signature of Sponsor's Representative		
Signature: _____	Company Name: _____	
Print Name: _____	Date: _____	
Title: _____		

**** END OF SECTION ****

**TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT**

437 Old Mammoth Road, Suite 230
Post Office Box 1609
Mammoth Lakes, CA 93546

PROPOSAL AND CONTRACT BOOKLET

(Bid Form Package)

For

***The Construction of
Mammoth Yosemite Airport
Multipurpose Building –
Phase 2***

IN

Mammoth Lakes, California

Federal Aid Project No. AIP 3-06-0146-0XX-2026

PRE-BID MEETING

***Wednesday, June 10, 2026 at 1:00 PM
Airport Manager's Office
Mammoth Yosemite Airport
and by Zoom***

BID OPENING

***Wednesday, July 8, 2026 at 3:00 PM
Online Bid Portal
Public Bid Opening
Can Attend by Zoom***

***Contractor must submit complete Proposal and Contract Booklet (Bid Form Package)
with bid (Appendix B).***

Proposal and Contract – Multipurpose Building –Phase 2

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(DO NOT DETACH)

**PROPOSAL
TO THE TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT**

**Mammoth Yosemite Airport
Multipurpose Building – PHASE 2**

AIP NO. 3-06-0146-0XX-2026

Pre-Bid Meeting Date: Wednesday, June 10, 2026 at 1:00 p.m.

Place of Pre-Bid Meeting:

Mammoth Yosemite Airport, Airport Manager's Office, 1300 Airport Road, Mammoth Lakes, CA 93546

And by Zoom – Information posted on Online Bid Portal

Bid Opening Date: Wednesday, July 8, 2026 at 3:00 p.m.

Bid Opening:

Zoom information posted on Online Bid Portal

NAME OF BIDDER _____

BUSINESS POST OFFICE BOX _____

CITY, STATE, ZIP _____

BUSINESS STREET ADDRESS _____

(Please include even if P.O. Box used)

CITY, STATE, ZIP _____

TELEPHONE NO: AREA CODE (____) _____

FAX NO: AREA CODE (____) _____

EMAIL ADDRESS: _____

CONTRACTOR LICENSE NO. _____

The undersigned bidder declares that bidder has carefully examined the Plans and Specifications, Instructions to Bidders, Special Provisions, Contract Form and Bond Forms including Addenda No.(s)_____ to the project described above.

The work for which this proposal is submitted is for construction in accordance with the special provisions (including the payment of not less than the State general prevailing wage rates or Federal minimum wage rates) the project plans described below, including any addenda thereto the contract annexed hereto, and also in accordance with the Federal Aviation Administration Advisory Circular 150/5370-10H, "Standards for Specifying Construction of Airports," the California Department Transportation Standard Plans, 2024 Edition, the Standard Specifications, 2024 Edition, and the Labor Surcharge And Equipment Rental Rates in effect on the date the work is accomplished.

SUBMIT THIS SHEET AS PART OF YOUR BID

It is understood that the project generally consists of the following work:

- Construction work for Multipurpose Building to Include SRE Components including grading, drainage, paving of the access road and apron, hardscapes, marking, fencing, building and building foundations and floor slabs and building interior and exterior utilities.

The undersigned agrees that he/she will order all materials and equipment under this contract and will commence work within ten (10) days after receiving written notice to proceed, that he/she will complete the work within 115 working days.

The undersigned further agrees that should he/she fail to complete any segment of work in the time specified, he/she will pay liquidated damages to the Town the sum of \$3,000.00 for each consecutive calendar day after time specified as prescribed in these specifications.

SUBMIT THIS SHEET AS PART OF YOUR BID

The special provisions for the work to be done are dated and entitled:

NOTICE INVITING BIDS AND SPECIAL PROVISIONS FOR

***The Construction of
Mammoth Yosemite Airport
Multipurpose Building
PHASE 2***

in
Mammoth Lakes, California

The project plans for the work to be done are dated and entitled:

**TOWN OF MAMMOTH LAKES
*Mammoth Yosemite Airport
Multipurpose Building
PHASE 2***

in
Mammoth Lakes, California

Bids are to be submitted for the entire work. The amount of the bid for comparison purposes will be the total of all items for the base bid schedule.

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 "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item.

In the case of a discrepancy between the product of the "Estimated Quantity" and the "Unit Price" with the "Item Total", the product of the "Estimated Quantity" and the "Unit Price" shall prevail and the figure shown as the "Item Total" shall be adjusted accordingly. In the case of a discrepancy between the sum of the figures in the "Item Total" column (adjusted per the previous sentence, if necessary) and the amount set forth as the "Total Bid Amount", the sum of the figures in the "Item Total" column shall prevail and the amount shown as the "Total Bid Amount" shall be adjusted accordingly. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern, except as provided in (a) or (b), as follows:

(a) If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item 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

SUBMIT THIS SHEET AS PART OF YOUR BID

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 percentagewise the unit price or item total in the Town's Final Estimate of cost.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise, if the item total for a lump sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or lump sums. Written unit prices, item totals and lump sums will be interpreted according to the number of digits and, if applicable, decimal placement. Cent symbols also have no significance in establishing any unit price or item total since all figures are assumed to be expressed in dollars and/or decimal fractions of a dollar. Bids on lump sum items shall be item totals only; if any unit price for a lump sum item is included in a bid and it differs from the item total, the items total shall prevail.

The foregoing provisions for the resolution of specific irregularities cannot be so comprehensive as to cover every omission, inconsistency, error, or other irregularity, which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the *TOWN OF MAMMOTH LAKES*, and that discretion will be exercised in the manner deemed by the *TOWN OF MAMMOTH LAKES* to best protect the public interest in the prompt and economical completion of the work. The decision of the *TOWN OF MAMMOTH LAKES* respecting the amount of a bid, or the existence or treatment of an irregularity in a bid, shall be final.

If this proposal shall be accepted and the undersigned shall fail to enter into the contract and furnish the two (2) bonds in the sums required by the State Contract Act, with surety satisfactory to the *TOWN OF MAMMOTH LAKES* within fifteen (15) days, after the bidder has received notice from the *TOWN OF MAMMOTH LAKES* that the contract has been awarded, the PUBLIC WORKS DEPARTMENT may, at its option, determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void and the forfeiture of the security accompanying this proposal shall operate and the same shall be the property of the *TOWN OF MAMMOTH LAKES*.

The undersigned, as bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm, or corporation; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, and the plans therein referred to; and he proposes, and agrees if this proposal is accepted, that he will contract with the *TOWN OF MAMMOTH LAKES*, in the form of the copy of the contract annexed hereto, to provide all necessary machinery, tools, apparatus, and other means of construction, and to do all the work and furnish all the materials specified in the contract, in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefor the following prices, to wit:

SUBMIT THIS SHEET AS PART OF YOUR BID

TOWN OF MAMMOTH LAKES
Mammoth Yosemite Airport
Multipurpose Building
PHASE 2

AIP NO. 3-06-0146-0XX-2026

CONTRACTOR'S BID
(Engineer's Estimate of Quantities)

**USE ELECTRONIC BID FORM
ON ONLINE BID PORTAL**

NOTE:

In the event the product of a unit price and an estimated quantity do not equal the extended amount stated, the unit price will govern and the correct product of the unit price and the estimated quantity shall be deemed to be the amount bid. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The Bidder shall list the name, address, and California license number of each subcontractor to whom the Bidder proposes to subcontract portions of the work, as required by the provisions in Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Special Provisions and Standard Specifications.

LIST OF SUBCONTRACTORS

<u>Name</u>	<u>Address</u>	<u>California Contractor License #*</u>	<u>Contractor DIR Number</u>	<u>Description of Work Subcontracted</u>

*An inadvertent error in California Contractor license number shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive as long as the corrected Contractor's license number is submitted to the Town by the prime contractor within 24 hours of the bid opening.

SUBMIT THIS SHEET AS PART OF YOUR BID

PUBLIC CONTRACT CODE

Public Contract Code Section 10285.1 Statement

In accordance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), 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 (3) 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 before "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Public Contract Code Section 10162 Questionnaire

In accordance with Public Contract Code Section 10162, 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:

SUBMIT THIS SHEET AS PART OF YOUR BID

Public Contract Code 10232 Statement

In accordance with Public Contract Code Section 10232, the Contractor hereby states, under penalty of perjury, that no more than one (1) final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two (2) year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note:

The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

SUBMIT THIS SHEET AS PART OF YOUR BID

NONCOLLUSION AFFIDAVIT

(Title 23 United States Code Section 112 and
Public Contract Code Section 7106)

To the TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that 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, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that 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, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note:

The above Noncollusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

SUBMIT THIS SHEET AS PART OF YOUR BID

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 the option checked below relating to the Bidder's fleet, and/or that of their subcontractor(s) ("Fleet") is true and correct:

- ☐ The Fleet is subject to the requirements of the Regulation, and the appropriate Certificate(s) of Reported Compliance have been attached hereto.
- ☐ The Fleet is exempt from the Regulation under section 2449.1(f)(2), and a signed description of the subject vehicles, and reasoning for exemption has been attached hereto.
- ☐ Bidder and/or their subcontractor is unable to procure R99 or R100 renewable diesel fuel as defined in the Regulation pursuant to section 2449.1(f)(3). Bidder shall keep detailed records describing the normal refueling methods, their attempts to procure renewable diesel fuel and proof that shows they were not able to procure renewable diesel (i.e. third party correspondence or vendor bids).
- ☐ The Fleet is exempt from the requirements of the Regulation pursuant to section 2449(i)(4) because this Project has been deemed an Emergency, as defined under section 2449(c)(18). Bidder shall only operate the exempted vehicles in the emergency situation and records of the exempted vehicles must be maintained, pursuant to section 2449(i)(4).
- ☐ The Fleet does not fall under the Regulation or are otherwise exempted and a detailed reasoning is attached hereto.

Name of Bidder: _____

Signature: _____

Name: _____

Title _____

Date: _____

SUBMIT THIS SHEET AS PART OF YOUR BID

CERTIFICATES REGARDING DEBARMENT

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 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 Certification of Offerer /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.

DATE _____ SIGNED BY _____

SUBMIT THIS SHEET AS PART OF YOUR BID

**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.

DATE _____ SIGNED BY _____

SUBMIT THIS SHEET AS PART OF YOUR BID

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 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.

DATE _____ SIGNED BY _____

SUBMIT THIS SHEET AS PART OF YOUR BID

DISCLOSURE OF LOBBYING ACTIVITIES

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

1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	3. Report Type: <input type="checkbox"/> a. initial <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____
4. Name and Address of Reporting Entity <input type="checkbox"/> Prime <input type="checkbox"/> 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) \$ _____ <input type="checkbox"/> actual <input type="checkbox"/> planned	13. Type of Payment (check all that apply) <input type="checkbox"/> a. retainer <input type="checkbox"/> b. one-time fee <input type="checkbox"/> c. commission <input type="checkbox"/> d. contingent fee <input type="checkbox"/> e. deferred <input type="checkbox"/> f. other, specify _____	
12. Form of Payment (check all that apply): <input type="checkbox"/> a. cash <input type="checkbox"/> b. in-kind; specify: nature _____ value _____		
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 <input type="checkbox"/> No <input type="checkbox"/>		
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 Standard Form LLL Rev. 09-12-97		

Federal Use Only:

SUBMIT THIS SHEET AS PART OF YOUR BID

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 influenced the covered Federal action.
(b) Enter the full names of the individual(s) performing services and include full address if different from 10 (a). 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. SF-LLL-Instructions Rev. 06-04-90«ENDIF»

SUBMIT THIS SHEET AS PART OF YOUR BID

BIDDERS LIST COLLECTION FORM

Prime Contractor			
Firm Name: _____	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____		Phone: _____
NAICS Code(s) associated with Bid Project	Race of Majority Owner	Age of Firm	Annual Gross Receipts
	<input type="checkbox"/> Black American <input type="checkbox"/> Non-minority <input type="checkbox"/> Hispanic American <input type="checkbox"/> Other <input type="checkbox"/> Asian-Pacific American <input type="checkbox"/> Subcontinent Asian American <input type="checkbox"/> Native American	<input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1 - 3 years <input type="checkbox"/> 4 - 7 years <input type="checkbox"/> 8 - 10 years <input type="checkbox"/> More than 10 years	<input type="checkbox"/> Less than \$1 million <input type="checkbox"/> \$1 - \$3 million <input type="checkbox"/> \$3 - \$6 million <input type="checkbox"/> \$6 - \$10 million <input type="checkbox"/> Over \$10 million
Gender of Majority Owner			
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other			

Sub Contractor			
Firm Name: _____	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____		Phone: _____
NAICS Code(s) associated with Bid Project	Race of Majority Owner	Age of Firm	Annual Gross Receipts
	<input type="checkbox"/> Black American <input type="checkbox"/> Non-minority <input type="checkbox"/> Hispanic American <input type="checkbox"/> Other <input type="checkbox"/> Asian-Pacific American <input type="checkbox"/> Subcontinent Asian American <input type="checkbox"/> Native American	<input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1 - 3 years <input type="checkbox"/> 4 - 7 years <input type="checkbox"/> 8 - 10 years <input type="checkbox"/> More than 10 years	<input type="checkbox"/> Less than \$1 million <input type="checkbox"/> \$1 - \$3 million <input type="checkbox"/> \$3 - \$6 million <input type="checkbox"/> \$6 - \$10 million <input type="checkbox"/> Over \$10 million
Gender of Majority Owner			
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other			

Sub Contractor			
Firm Name: _____	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____		Phone: _____
NAICS Code(s) associated with Bid Project	Race of Majority Owner	Age of Firm	Annual Gross Receipts
	<input type="checkbox"/> Black American <input type="checkbox"/> Non-minority <input type="checkbox"/> Hispanic American <input type="checkbox"/> Other <input type="checkbox"/> Asian-Pacific American <input type="checkbox"/> Subcontinent Asian American <input type="checkbox"/> Native American	<input type="checkbox"/> Less than 1 year <input type="checkbox"/> 1 - 3 years <input type="checkbox"/> 4 - 7 years <input type="checkbox"/> 8 - 10 years <input type="checkbox"/> More than 10 years	<input type="checkbox"/> Less than \$1 million <input type="checkbox"/> \$1 - \$3 million <input type="checkbox"/> \$3 - \$6 million <input type="checkbox"/> \$6 - \$10 million <input type="checkbox"/> Over \$10 million
Gender of Majority Owner			
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other			

SUBMIT THIS SHEET AS PART OF YOUR BID

Sub Contractor			
Firm Name: _____	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____	Phone: _____	
NAICS Code(s) associated with Bid Project	Race of Majority Owner	Age of Firm	Annual Gross Receipts
	<input type="checkbox"/> Black American	<input type="checkbox"/> Non-minority	<input type="checkbox"/> Less than 1 year
	<input type="checkbox"/> Hispanic American	<input type="checkbox"/> Other	<input type="checkbox"/> 1 - 3 years
	<input type="checkbox"/> Asian-Pacific American		<input type="checkbox"/> 4 - 7 years
	<input type="checkbox"/> Subcontinent Asian American		<input type="checkbox"/> 8 - 10 years
Gender of Majority Owner		<input type="checkbox"/> More than 10 years	<input type="checkbox"/> Less than \$1 million
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other	<input type="checkbox"/> Native American		<input type="checkbox"/> \$1 - \$3 million
			<input type="checkbox"/> \$3 - \$6 million
			<input type="checkbox"/> \$6 - \$10 million
			<input type="checkbox"/> Over \$10 million

Sub Contractor			
Firm Name: _____	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____	Phone: _____	
NAICS Code(s) associated with Bid Project	Race of Majority Owner	Age of Firm	Annual Gross Receipts
	<input type="checkbox"/> Black American	<input type="checkbox"/> Non-minority	<input type="checkbox"/> Less than 1 year
	<input type="checkbox"/> Hispanic American	<input type="checkbox"/> Other	<input type="checkbox"/> 1 - 3 years
	<input type="checkbox"/> Asian-Pacific American		<input type="checkbox"/> 4 - 7 years
	<input type="checkbox"/> Subcontinent Asian American		<input type="checkbox"/> 8 - 10 years
Gender of Majority Owner		<input type="checkbox"/> More than 10 years	<input type="checkbox"/> Less than \$1 million
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other	<input type="checkbox"/> Native American		<input type="checkbox"/> \$1 - \$3 million
			<input type="checkbox"/> \$3 - \$6 million
			<input type="checkbox"/> \$6 - \$10 million
			<input type="checkbox"/> Over \$10 million

Sub Contractor			
Firm Name: _____	Certified DBE: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____	Phone: _____	
NAICS Code(s) associated with Bid Project	Race of Majority Owner	Age of Firm	Annual Gross Receipts
	<input type="checkbox"/> Black American	<input type="checkbox"/> Non-minority	<input type="checkbox"/> Less than 1 year
	<input type="checkbox"/> Hispanic American	<input type="checkbox"/> Other	<input type="checkbox"/> 1 - 3 years
	<input type="checkbox"/> Asian-Pacific American		<input type="checkbox"/> 4 - 7 years
	<input type="checkbox"/> Subcontinent Asian American		<input type="checkbox"/> 8 - 10 years
Gender of Majority Owner		<input type="checkbox"/> More than 10 years	<input type="checkbox"/> Less than \$1 million
<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other	<input type="checkbox"/> Native American		<input type="checkbox"/> \$1 - \$3 million
			<input type="checkbox"/> \$3 - \$6 million
			<input type="checkbox"/> \$6 - \$10 million
			<input type="checkbox"/> Over \$10 million

Please copy page if you need to add more subcontractors.

SUBMIT THIS SHEET AS PART OF YOUR BID

FOSTERING SMALL BUSINESS PARTICIPATION
Background 49 CFR §23.26 and §26.39

The Sponsor has established a Small Business Element in accordance with 49 CFR Part 23 and 26 to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation and to create a level playing field on which small businesses can compete fairly. While there is no specific numerical goal assigned to small business participation the prime contractor/concessionaire should make every effort to solicit small business concerns (as defined in 13 CFR Part 121 or 49 CFR Part 23.33) to participate as sub-contractors/sub-concessionaries, service providers, suppliers, etc.

The Sponsor encourages small business participation, including AC/DBE certified firms and SBA certified Small Disadvantaged Business (SDB), Women-Owned Small Business/Economically Disadvantaged Women-Owned Small Businesses (ED/WOSB), Veteran-Owned Small Business/Service-Disabled Veteran-Owned Small Business (SD/VOSB), 8(a) Small Business Development Program (8(a)), SBA Mentor-Protégé Program (SBA MP), and HUBZone Program (HUBZone).

AC/DBE certified firms can be located through the State's UCP website and SBA certified firms can be located through the Small Business Search Tool (<https://beta-search.certify.sba.gov/advanced> and https://dsbs.sba.gov/search/dsp_dsbs.cfm).

Prime Information

Firm Name: _____
 Firm Address: _____ City: _____ State: _____ Zip Code: _____
 Contact Name: _____ Email Address: _____ Phone: _____

Small Business Firms to be Utilized

Firm Name: _____
 Firm Address: _____ City: _____ State: _____ Zip Code: _____
 Contact Name: _____ Email Address: _____ Phone: _____

Is the firm currently certified? If yes, check the appropriate box(es) and provide proof of certification. If no, complete the non-certified small business verification form.

☐ AC/DBE ☐ SDB ☐ ED/WOSB ☐ SD/VOSB ☐ 8(a) ☐ SBA MP ☐ HUBZone ☐ No, Verification Form Attached

NAICS Code	Description of Work to be Performed	Estimated Total Cost of Work
		\$ -
		\$ -
		\$ -
		\$ -
Total Amount		\$ -

Firm Name: _____
 Firm Address: _____ City: _____ State: _____ Zip Code: _____
 Contact Name: _____ Email Address: _____ Phone: _____

Is the firm currently certified? If yes, check the appropriate box(es) and provide proof of certification. If no, complete the non-certified small business verification form.

☐ AC/DBE ☐ SDB ☐ ED/WOSB ☐ SD/VOSB ☐ 8(a) ☐ SBA MP ☐ HUBZone ☐ No, Verification Form Attached

NAICS Code	Description of Work to be Performed	Estimated Total Cost of Work
		\$ -
		\$ -
		\$ -
		\$ -
Total Amount		\$ -

Firm Name: _____
 Firm Address: _____ City: _____ State: _____ Zip Code: _____
 Contact Name: _____ Email Address: _____ Phone: _____

Is the firm currently certified? If yes, check the appropriate box(es) and provide proof of certification. If no, complete the non-certified small business verification form.

☐ AC/DBE ☐ SDB ☐ ED/WOSB ☐ SD/VOSB ☐ 8(a) ☐ SBA MP ☐ HUBZone ☐ No, Verification Form Attached

NAICS Code	Description of Work to be Performed	Estimated Total Cost of Work
		\$ -
		\$ -
		\$ -
		\$ -
Total Amount		\$ -

Prime Signature

Signature: _____ Company Name: _____
 Print Name: _____ Date: _____
 Title: _____

Reviewer Certification (For use by Sponsor Only)

Signature: _____ Company Name: _____
 Print Name: _____ Date: _____
 Title: _____

SUBMIT THIS SHEET AS PART OF YOUR BID

NON-CERTIFIED SMALL BUSINESS VERIFICATION FORM

Background 49 CFR 523.26 AND 526.39			
Firms seeking to participate under the Sponsor's Small Business Element who are not certified under one of the pre-qualified certifications listed on the Fostering Small Business Participation Form but believe their firm meets the small business requirements per 13 CFR Part 121 or 49 CFR 23.33 should complete the attached form and provide the requested documentation. Firms meeting the requirements as verified by the Sponsor are eligible to participate in the Small Business Participation Plan.			
Firm Information			
Firm Name: _____			
Firm Address: _____	City: _____	State: _____	Zip Code: _____
Contact Name: _____	Email Address: _____	Phone: _____	
Business Profile			
Describe the primary activities of your firm:		Associated NAICS Codes:	
Number of Employees			
Full-time: _____		Part-time: _____ Total: _____	
Gross Receipts of Firm			
Gross Receipts of Firm for the last 5 years: Attach tax returns for the last five years.	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
		Average Receipts:	\$ _____ -
Gross Receipts for all Affiliates*			
Gross Receipts of Affiliates for the last 5 years: Affiliates are defined in accordance with the Small Business Administration (SBA) definition. Attach tax returns for all affiliate firms for the last five years.	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
	Year: _____	Total Receipts:	\$ _____ -
		Average Receipts:	\$ _____ -
Firm Signature			
The firm attests that the presented information is accurate and correct.			
Signature: _____		Company Name: _____	
Print Name: _____		Date: _____	
Title: _____			
Reviewer Certification (For use by Sponsor Only)			
The above presented information and attachments have been reviewed and it is concluded that:		<input type="checkbox"/> Meets the requirements of a Small Business <input type="checkbox"/> Does not meet the requirements of a Small Business	
Signature: _____		Employer: _____	
Print Name: _____		Date: _____	
Title: _____			

SUBMIT THIS SHEET AS PART OF YOUR BID

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

SUBMIT THIS SHEET AS PART OF YOUR BID

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.

DATE _____ SIGNED BY _____

SUBMIT THIS SHEET AS PART OF YOUR BID

CERTIFICATION OF COMPLIANCE WITH FAA BUY AMERICAN PREFERENCE

The Contractor certifies that its bid/offer is in compliance with 49 USC § 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.

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.

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

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.

SUBMIT THIS SHEET AS PART OF YOUR BID

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 submit to the Airport Sponsor or FAA within 15 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) 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

SUBMIT THIS SHEET AS PART OF YOUR BID

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 from
- 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

SUBMIT THIS SHEET AS PART OF YOUR BID

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 (✓) 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 twentyfour (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

SUBMIT THIS SHEET AS PART OF YOUR BID

**CERTIFICATION OF 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 [Public Law 115-232 § 889(f)(1)].

DATE _____ SIGNED BY _____

SUBMIT THIS SHEET AS PART OF YOUR BID

IRAN CONTRACTING ACT CERTIFICATION (Public Contract Code § 2204)

MAMMOTH YOSEMITE AIRPORT, MULTIPURPOSE BUILDING – PHASE 2
 (“Project” or “Contract”)

Pursuant to Public Contract Code (PCC) section 2204, an Iran Contracting Act certification is required for solicitations of goods or services of one million dollars (\$1,000,000) or more.

Bidder shall complete **ONLY ONE** of the following three paragraphs.

- ☐ 1. Bidder’s total bid is less than one million dollars (\$1,000,000).

OR

- ☐ 2. Bidder’s total bid is one million dollars (\$1,000,000) or more, but Bidder is **not** on the current list of persons engaged in investment activities in Iran created by the California Department of General Services (“DGS”) pursuant to Public Contract Code § 2203(b), and Bidder is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

OR

- ☐ 3. Bidder’s total bid one million dollars (\$1,000,000) or more, but the Town has given prior written permission to Bidder to submit a proposal pursuant to PCC 2203(c) or (d). **A copy of the written permission from the Town is included with Bid.**

I certify that I am duly authorized to legally bind the bidder to this certification, that the contents of this certification are true, and that this certification is made under the laws of the State of California.

DATE _____ SIGNED BY _____

SUBMIT THIS SHEET AS PART OF YOUR BID

Accompanying this proposal is _____

(NOTICE: INSERT THE WORDS "CASH (\$_____)," "CASHIER'S CHECK,"
"CERTIFIED CHECK," OR "BIDDER'S BOND," AS THE CASE JUNE BE)

an amount equal to **at least ten percent (10%)** of the total of the bid.

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE

If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if bidder or other interested person is an individual, state first and last names in full.

Licensed in accordance with an act providing for the registration of Contractors,

License No. _____ Classification(s) _____

ADDENDA - This Proposal is submitted with respect to the changes to the contract included in addenda number/s _____

(Fill in addenda numbers if addenda have been received and insert, in this Proposal, any Engineer's Estimate sheets that were received as part of the addenda.)

By my signature on this proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Sections 10162, 10232, and 10285.1 are true and correct and that the bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission Regulations (Chapter 5, Title 2 of the California Administrative Code). By my signature on this proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Noncollusion Affidavit required by Title 23 United States Code, Section 112 and Public Contract Code Section 7106; and the Title 49 Code of Federal Regulations, Part 29 Debarment and Suspension Certification are true and correct.

The undersigned as bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any persons, firm, or corporation; and he proposes and agrees, if the proposal is accepted, that he will execute a Contract with the Town of Mammoth Lakes in the form set forth in the Contract Documents and that he will accept in full payment thereof the prices, to wit:

Date: _____



Signature and Title of Bidder _____

Business Address _____

Place of Business _____

Place of Residence _____

SUBMIT THIS SHEET AS PART OF YOUR BID

TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT

BIDDER'S BOND

We, _____,
_____ As Principal, and

as Surety are bound unto the TOWN OF MAMMOTH LAKES, State of California, hereafter referred to as "Obligee," in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitted to the Obligee, for _____

The Construction of Mammoth Yosemite Airport Multipurpose Building – Phase 2

for which bids are to be opened at Town of Mammoth Lakes, California, on _____

±

(Insert date of bid opening)

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two (2) bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event suit is bought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: _____, 20____.

Principal

Surety
By: _____
Attorney-in-Fact

CERTIFICATE OF ACKNOWLEDGEMENT

State of California
City/County of _____ ss

On this _____ day of _____, in the year 20__, before me _____,
personally appeared _____, personally known to me (or proved to me on
Attorney-in-fact

the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument as the attorney-in-fact of, and acknowledged to me that he (she) subscribed the name of the said company thereto as surety, and his (her) own name as attorney-in-fact.

(SEAL)

Notary Public

SUBMIT THIS SHEET AS PART OF YOUR BID

CONTRACT

TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT

AIP NO. 3-06-0146-____

THIS CONTRACT, is made and concluded, in duplicate, this _____ between the Town of Mammoth Lakes (“Town”) and _____ (“Contractor”)

Article I. That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Town, and under the conditions expressed in the two (2) bonds, bearing even date with these presents, and hereunto annexed, the Contractor agrees, at his/her own proper cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the specifications to be furnished by the Town, necessary to construct and complete in a good, workmanlike and substantial manner and to the satisfaction of the Town, the work described in the Contract Documents, including the special provisions and the project plans described below, including any addenda thereto, and also in accordance with the Federal Aviation Administration Advisory Circular 150/5370-10H, "Standards for Specifying Construction of Airports," California Department of Transportation Standard Plans, 2024 edition, the Standard Specifications, 2024 edition, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished, which said special provisions, project plans, Standard Plans, Standard Specifications, and Labor Surcharge and Equipment Rental Rates are hereby specially referred to and by such reference made a part hereof.

The special provisions for the work to be done are entitled:

TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT
**CONTRACT AND BID DOCUMENTS FOR
MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

In
Mammoth Lakes, CA
and the project plans entitled
**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

In
Mammoth Lakes, CA

The Contractor and its surety shall be liable to the Town for any damages arising as a result of the Contractor's failure to comply with this obligation.

Article II. The Town hereby promises and agrees with said Contractor to contract with the Contractor to provide the materials and to do the work according to the terms and conditions herein contained and referred to, for the prices hereinafter set forth, and hereby contracts to pay the same at the time, in the manner, and upon the conditions herein set forth; and the said parties for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to the full performance of the covenants herein contained.

Article III. Contractor agrees to receive and accept the following prices as full compensation for furnishing all materials and for doing all the work contemplated and embraced in this Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs; also for 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 *Town of Mammoth Lakes*, and for all risks of every description connected with the work; also for all expenses incurred by or in consequence of the suspension or discontinuance of work and for well and faithfully completing the work, and the whole thereof, in the manner and according to the plans and specifications, and the requirements of the Engineer under them, to wit:

*Engineers Estimate of Quantities and Bid Prices will be inserted here
(Items in CONTRACT will be the same as those bid in PROPOSAL.)*

Article IV. It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument and the bid or proposal of said Contractor, then this instrument shall control and nothing herein shall be considered as an acceptance of the said terms of said proposal conflicting herewith.

Article V. The Work shall be commenced on the date stated in the Town's Notice to Proceed. The contractor will be allowed _____ () working days to complete all Work required by the Contract Documents, beginning from the commencement date stated in the Notice to Proceed to begin Work. By its signature hereunder, Contractor agrees the time for completion set forth above is adequate and reasonable to complete the Work.

Article VI. In accordance with Government Code section 53069.85, it is agreed that the Contractor will pay the Town the sum of \$3,000.00 for each and every calendar day of delay beyond the time prescribed in the Contract Documents for finishing the Work, as Liquidated Damages and not as a penalty or forfeiture. In the event this is not paid, the Contractor agrees the Town may deduct that amount from any money due or that may become due the Contractor under the Contract. This Article does not exclude recovery of other damages specified in the Contract Documents.

Article VII. Termination of Agreement. The Town may terminate this agreement by providing a thirty (30) day written notice to the Contractor.

Article VIII. The Contractor acknowledges that it has examined the prevailing rate of per diem wages as established by the California Director of Industrial Relations. The Contractor agrees to

pay workers not less than the applicable prevailing rate of per diem wages, as set forth in these requirements. Contractor shall comply, and shall require each subcontractor employed by Contractor on the Project to comply, with the requirements of Labor Code Section 1776, including without limitation the requirement to maintain certified payroll records. Contractor shall submit certified payroll records directly to the California Labor Commissioner. At all times during the course of Contractor's work on the Project, Contractor shall remain registered with the Department of Industrial Relations and qualified to perform public work pursuant to Labor Code Section 1725.5, and Contractor shall ensure that all subcontractors employed on the Project by Contractor also remain so registered. 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 Section 4104 of the Public Contract Code), or engage in the performance of any contract for public work, as defined in Chapter 1 of Part 7 of Division 2 of the Labor Code, unless currently registered with the Department of Industrial Relations and qualified to perform public work pursuant to Section 1725.5. However, an unregistered contractor may submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Sections 10164 or 20103.5 of the Public Contract Code, provided that the contractor is registered to perform public work at the time the contract is awarded. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code sections 1725.5 and 1771.1. This project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations.

Contractor agrees to be bound by and comply with the provisions of sections 1777.5 et seq. of the Labor Code in respect to apprentices.

In addition, all mechanics and laborers on the project shall be paid no less than the minimum wage rate established by the U.S. Secretary of Labor.

The higher of the two rates shall be paid.

A copy of the Department of Labor Wage Rate Determination and the Department of Industrial Relations prevailing wages applicable to this contract is included as Attachment 2 to this Agreement.

Article IX. By my signature hereunder, as Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's 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 X. STATE LICENSE BOARD 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 XI. Should a change be contemplated in the name or nature of the Contractor's legal entity, the Contractor shall first notify the Town in order that proper steps may be taken to have the change reflected on the Contract.

Article XII. ASSIGNMENT OF ANTITRUST ACTIONS. Pursuant to Section 7103.5 of the Public Contract Code, in entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, Contractor or subcontractor offers and agrees to assign to the Town 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. Section 15) or under the Cartwright Act (chapter 2 (commencing with Section 16700) of part 2 of division 7 of the Business and Professions Code), arising from the purchase of goods, services, or materials pursuant to this Contract or any subcontract. This assignment shall be made and become effective at the time the Town makes final payment to the Contractor, without further acknowledgment by the parties.

Article XIII. The Contractor shall include in its bid amount the patent fees or royalties on any patented article or process furnished or used in the Work. Contractor shall assume all liability and responsibility arising from the use of any patented, or allegedly patented, materials, equipment, devices or processes used in or incorporated with The Work, and shall defend, indemnify and hold harmless the Town, its officials, officers, agents, employees and representatives from and against any and all liabilities, demands, claims, damages, losses, costs and expenses, of whatsoever kind or nature, arising from such use.

Article XIV. Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The Contractor shall comply with all requirements of applicable federal, state and local laws, rules and regulations, including, but not limited to, the provisions of the California Labor Code and California Public Contract Code which are applicable to this Project.

Article XV. Contractor shall provide indemnification as set forth in the Special Provisions.

Article XVI. The work to be done under this agreement is being financed in whole or in part by means of a grant made by the United States acting through the Federal Aviation Administration of the Department of Transportation. The Contractor must adhere to the Required Contract Provisions for Airport Improvement Program and for Obligated Sponsors, included as Attachment 1 to this Agreement.

[REMAINDER OF PAGE LEFT BLANK]

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands the year and date first above

TOWN OF MAMMOTH LAKES
PUBLIC WORKS DEPARTMENT

By _____
Rob Patterson, Town Manager

Contractor

Name _____
Print

By _____
Signature

License No. _____

Federal Employer Identification
Number _____

PAYMENT BOND

WHEREAS, The Town of Mammoth Lakes, hereafter referred to as “Obligee,” has awarded to Contractor _____ hereafter designated as the “Principal,” a contract for the work described as follows:

MAMMOTH YOSEMITE AIRPORT MULTIPURPOSE BUILDING PHASE 2

AND WHEREAS, said Principal is required to furnish a bond in connection with said contract, to secure the payment of claims of laborers, mechanics, materialmen, and other persons as provided by law.

NOW, THEREFORE, we the undersigned Principal and Surety are bound unto the Obligee in the sum of _____ Dollars (\$ _____) for which payment, we bind ourselves, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH,

That if said Principal or any of its subcontractors shall fail to pay any of the persons named in Civil Code Section 9100, 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 by such claimant, or any amounts required to be deducted, withheld, and paid over to the Employment Development Department or the Franchise Tax Board for the wages of employees of the Principal and his/her subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor, that the surety herein will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought upon this bond, the surety will pay all litigation expenses incurred by the Town 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 Civil Code Section 9100 as to give a right of action to such persons or heir 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 Town 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/her claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract 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 Contract. including but not limited to the provisions of Sections 2819 and 2845 of the California Civil Code.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporation.

Dated: _____, 20____.

CORPORATE SEAL

Principal

CORPORATE SEAL

Surety

By: _____
Attorney in Fact

(ATTACH ATTORNEY IN FACT CERTIFICATE

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

Correspondence or claims relating to this bond should be sent to the surety at the following address:

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

DESCRIPTION OF ATTACHED DOCUMENT

- ☐ 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)

Title or Type of Document

Number of Pages

Date of Document

Signer(s) Other Than Named Above

FAITHFUL PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the Town of Mammoth Lakes (“Town”), acting by and through its Public Works Department, has awarded to _____ (the “Contractor”), a contract for _____ (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 dated _____, (hereinafter referred to as “Contract Documents”), the terms and conditions of which are expressly incorporated herein by reference; and

AND WHEREAS, the Contractor is required by the Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of the 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, held and firmly bound unto the Town 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 above bound Contractor, his/her or 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, and shall indemnify and save harmless the Town, its officers and agents, as therein stipulated, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, Contractor’s guarantee obligation shall hold good for a period of one (1) year after the acceptance of the work by the Town, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the Town 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 Town’s rights or the Contractor’s or Surety’s obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

As a part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees incurred by the Town in enforcing such obligation.

Whenever Contractor shall be, and is declared by the Town to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the Town'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 Town, 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 Town under the Contract and any modification thereto, less any amount previously paid by the Town to the Contractor and any other set offs pursuant to the Contract Documents.
3. Permit the Town 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 Town under the Contract and any modification thereto, less any amount previously paid by the Town to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the Town 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 Town, when declaring the Contractor in default, notifies Surety of the Town'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, including but not limited to the provisions of Sections 2819 and 2845 of the California Civil Code.

[Remainder of Page Left Intentionally Blank]

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20____, the name and corporate seal of each corporation.

Dated: _____, 20____.

CORPORATE SEAL

Principal

CORPORATE SEAL

Surety

By: _____
Attorney in Fact

(ATTACH ATTORNEY IN FACT CERTIFICATE

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

Correspondence or claims relating to this bond should be sent to the surety at the following address:

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

DESCRIPTION OF ATTACHED DOCUMENT

- ☐ 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)

Title or Type of Document

Number of Pages

Date of Document

Signer(s) Other Than Named Above

Attachment 1

Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects

A1 ACCESS TO RECORDS AND REPORTS

2 CFR § 200.334

2 CFR § 200.337

FAA Order 5100.38

ACCESS TO RECORDS AND REPORTS

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

2 CFR Part 200, Appendix II(A)

BREACH OF CONTRACT TERMS

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

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)

FAA BUY AMERICAN PREFERENCE

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.

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.

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.

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 U.S.C. § 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 (ü) or the letter “X”.

- ☐ Bidder or offeror hereby certifies that it will comply with 49 U.S.C. § 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 U.S.C. § 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.

Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects

- 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) 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 from
- 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;

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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

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:

As a condition of a grant award, the Sponsor shall demonstrate that it complies with the provisions of Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq) and implementing regulations (49 CFR part 21) including amendments thereto, the Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123), the Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.), Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 et seq.), the Americans with Disabilities Act of 1990 (42 U.S.C. § 12101, et seq.), U.S. Department of Transportation and Federal Aviation Administration (FAA) Assurances, and other relevant civil rights statutes, regulations, or authorities, including any amendments or updates thereto. This may include, as applicable, providing a current Title VI Program Plan to the FAA for approval, in the format and according to the timeline required by the FAA, and other information about the communities that will be benefited and impacted by the project. A completed FAA Title VI Pre-Grant Award Checklist is required for every grant application, unless excused by the FAA. The Sponsor shall affirmatively ensure that when carrying out any project supported by this grant that it complies with all federal nondiscrimination and

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Issued on December 29, 2025

Mammoth Yosemite Airport – Multipurpose Building Phase 2

Agreement – Attachment 1

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civil rights laws based on race, color, national origin, sex, creed, age, disability, genetic information, in consideration for federal financial assistance. The Department's and FAA's Office of Civil Rights may provide resources and technical assistance to recipients to ensure full and sustainable compliance with Federal civil rights requirements. Failure to comply with civil rights requirements will be considered a violation of the agreement or contract and be subject to any enforcement action as authorized by law.

Title VI List of Pertinent Nondiscrimination Acts and Authorities

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:

Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects

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.

Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects

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

CLEAN AIR AND WATER POLLUTION CONTROL

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.

Contractor must include this requirement in all subcontracts that exceed \$150,000.

A7 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

2 CFR Part 200, Appendix II(E)

29 CFR § 5.5(b)

40 U.S.C. § 3702

40 U.S.C. § 3704

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 therefor 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

Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects

the sum of \$29 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

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

2 CFR Part 200, Appendix II(D)

29 CFR Part 5

49 USC § 47112(b)

40 USC §§ 3141-3144, 3146, and 3147

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

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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

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

49 CFR Part 26

The requirements of 49 CFR Part 26 including any amendments thereto apply to this contract. It is the policy of the Town of Mammoth Lakes 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.

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

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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 seven (7) days from the receipt of each payment the prime contractor receives from Town of Mammoth Lakes. The prime contractor agrees further to return retainage payments to each subcontractor within seven (7) 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 Town of Mammoth Lakes. This clause applies to both DBE and non-DBE subcontractors.

A12 DISTRACTED DRIVING

Executive Order 13513

DOT Order 3902.10

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

2 CFR § 200, Appendix II(K)

2 CFR § 200.216

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 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

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.

A15 LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

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.

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- (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.

A16 OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

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.

A17 PROCUREMENT OF RECOVERED MATERIALS

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))

PROCUREMENT OF RECOVERED MATERIALS

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

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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.

A18 SEISMIC SAFETY

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.

A19 TAX DELINQUENCY AND FELONY CONVICTIONS

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

- 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 (☐) 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.

A20 TERMINATION OF CONTRACT

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.

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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.

A21 TRADE RESTRICTION CERTIFICATION

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.

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A22 VETERAN'S PREFERENCE

49 USC § 47112(c)

VETERAN'S PREFERENCE

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.

A23 DOMESTIC PREFERENCES FOR PROCUREMENTS

2 CFR § 200.322

2 CFR Part 200, Appendix II(L)

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.

A24 PROHIBITION OF COVERED UNMANNED AIRCRAFT SYSTEMS (UAS)

FAA Reauthorization Act of 2024 (Public Law 118-63), Section 936

49 U.S.C. § 44801 note

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 CONTRACT PROVISIONS FOR OBLIGATED SPONSORS AND AIP PROJECTS

Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects

Issued on December 29, 2025

Mammoth Yosemite Airport – Multipurpose Building Phase 2

Agreement – Attachment 1

Page 24 of 24

"General Decision Number: CA20260020 05/18/2026

State: California

Construction Types: Building, Heavy and Highway

Counties: California Counties of
Inyo, Kern and Mono

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	01/30/2026
3	05/18/2026

ASBE0005-001 07/01/2024

Rates

Fringes
INSULATOR/ASBESTOS WORKER: INCLUDES THE APPLICATION
OF ALL INSULATING MATERIALS, PROTECTIVE
COVERINGS, COATINGS & FINISHES TO ALL TYPES OF
MECHANICAL SYSTEMS INYO AND KERN.....\$ 56.32
26.52
FIRE STOP TECHNICIAN: APPLICATION OF FIRESTOPPING
MATERIALS FOR WALL OPENINGS AND PENETRATIONS IN
WALLS, FLOORS, CEILINGS AND CURTAIN WALLS (INYO
AND KERN).....\$ 39.94
20.65

ASBE0005-001 09/01/2024

Rates

Fringes
INSULATOR/ASBESTOS WORKER: INCLUDES THE APPLICATION
OF ALL INSULATING MATERIALS, PROTECTIVE
COVERINGS, COATINGS & FINISHES TO ALL TYPES OF

MECHANICAL SYSTEMS INYO AND KERN.....\$ 56.32
26.52
FIRE STOP TECHNICIAN: APPLICATION OF FIRESTOPPING
MATERIALS FOR WALL OPENINGS AND PENETRATIONS IN
WALLS, FLOORS, CEILINGS AND CURTAIN WALLS (INYO
AND KERN).....\$ 39.94
20.65

ASBE0005-005 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 (INYO AND
KERN).....\$ 23.52
13.37

ASBE0016-003 01/01/2024

Rates

Fringes
ASBESTOS WORKERS/INSULATOR: INCLUDES THE
APPLICATION OF ALL INSULATING MATERIALS,
PROTECTIVE COVERINGS, COATINGS, AND FINISHES TO
ALL TYPES OF MECHANICAL SYSTEMS (MONO).....\$ 64.56
25.07

BOIL0092-005 01/01/2024

Rates

Fringes
BOILERMAKER (INYO AND KERN).....\$ 51.98
42.11

BOIL0549-003 01/01/2021

Rates

Fringes
BOILERMAKER (MONO COUNTY).....\$ 45.60
38.99

BRCA0004-005 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

BRCA0018-010 09/01/2024

Rates

Fringes
 TERRAZZO WORKER/SETTER.....\$ 49.62
 15.26
 TERRAZZO FINISHER.....\$ 42.11
 14.67

BRCA0018-011 06/01/2023

Rates

Fringes
 TILE LAYER.....\$ 48.29
 19.18

BRCA0018-012 06/01/2024

Rates

Fringes
 TILE FINISHER (KERN).....\$ 37.96
 13.77
 MARBLE FINISHER (KERN).....\$ 43.38
 15.36

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

CARP0661-001 07/01/2021

Rates

Fringes
CARPENTER: (09) 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.\$ 42.80
16.28
CARPENTER: (08) SAW FILER 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.....\$ 51.03
16.28
CARPENTER: (07) ROOF LOADER OF SHINGLES
(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.....\$ 38.92
16.28
CARPENTER: (06) PNEUMATIC NAILER OR 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.....\$ 51.29
16.28
CARPENTER: (05) TABLE POWER SAW OPERATOR.....\$ 52.13
16.28
CARPENTER: (04) 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.....\$ 51.17
16.28
CARPENTER: (03) PILEDRIVERMEN; DERRICK BARGE; BRIDGE OR DOCK CARPENTER; HEAVY FRAMER; ROCKSLINGER; ROCK BARGEMAN; SCOWMAN 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.....\$ 51.73
16.28
CARPENTER: (02) 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.....\$ 52.10
16.48
CARPENTER: (01) CARPENTER, CABINET INSTALLER, INSULATION INSTALLER, 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.....\$ 51.03
16.28

CARP0721-001 07/01/2025

Rates
Fringes
MODULAR FURNITURE INSTALLER.....\$ 25.00
13.06

ELEC0428-001 12/30/2024

Rates
Fringes
ELECTRICIAN (CHINA LAKE NAVAL WEAPONS CENTER,
EDWARDS AFB).....\$ 65.40
22.15
CABLE SPLICER (CHINA LAKE NAVAL WEAPONS CENTER,
EDWARDS AFB).....\$ 71.07
22.32
CABLE SPLICER (REMAINDER OF KERN COUNTY).....\$ 62.32
22.06

ELEC0428-003 06/30/2025

Rates
Fringes
COMMUNICATIONS SYSTEM: INSTALLER (KERN COUNTY)
COMMUNICATIONS AND SYSTEMS WORK SCOPE OF WORK:
INSTALLATION, TESTING, SERVICE AND MAINTENANCE OF
SYSTEMS UTILIZING THE TRANSMISSION AND/OR
TRANSFERENCE OF VOICE, SOUND, VISION AND DIGITAL
FOR COMMERCIAL, EDUCATIONAL, SECURITY AND
ENTERTAINMENT PURPOSES FOR THE FOLLOWING: TV
MONITORING AND SURVEILLANCE, BACKGROUND-FOREGROUND
MUSIC, INTERCOM AND TELEPHONE INTERCONNECT,
INVENTORY CONTROL SYSTEMS, MICROWAVE TRANSMISSION,
MULTI-MEDIA, MULTIPLEX, NURSE CALL SYSTEMS, RADIO
PAGE, SCHOOL INTERCOM AND SOUND, BURGLAR ALARMS,
FIRE ALARM (SEE LAST PARAGRAPH BELOW) AND LOW
VOLTAGE MASTER CLOCK SYSTEMS IN COMMERCIAL
BUILDINGS. COMMUNICATION SYSTEMS THAT TRANSMIT OR
RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE
INTRINSIC TO THE ABOVE LISTED SYSTEMS; INCLUSION OR
EXCLUSION OF TERMINATIONS AND TESTINGS OF
CONDUCTORS DETERMINED BY THEIR FUNCTION; EXCLUDING
ALL OTHER DATA SYSTEMS OR MULTIPLE SYSTEMS WHICH
INCLUDE CONTROL FUNCTION OR POWER SUPPLY; EXCLUDING

INSTALLATION OF RACEWAY SYSTEMS, CONDUIT SYSTEMS,
LINE VOLTAGE WORK, AND ENERGY MANAGEMENT SYSTEMS.
FIRE ALARM WORK SHALL BE PERFORMED AT THE CURRENT
INSIDE WIREMAN TOTAL COST PACKAGE.....\$ 46.26

21.03

COMMUNICATIONS SYSTEM: INSTALLER (EDWARDS AFB)
COMMUNICATIONS AND SYSTEMS WORK SCOPE OF WORK:
INSTALLATION, TESTING, SERVICE AND MAINTENANCE OF
SYSTEMS UTILIZING THE TRANSMISSION AND/OR
TRANSFERENCE OF VOICE, SOUND, VISION AND DIGITAL
FOR COMMERCIAL, EDUCATIONAL, SECURITY AND
ENTERTAINMENT PURPOSES FOR THE FOLLOWING: TV
MONITORING AND SURVEILLANCE, BACKGROUND-FOREGROUND
MUSIC, INTERCOM AND TELEPHONE INTERCONNECT,
INVENTORY CONTROL SYSTEMS, MICROWAVE TRANSMISSION,
MULTI-MEDIA, MULTIPLEX, NURSE CALL SYSTEMS, RADIO
PAGE, SCHOOL INTERCOM AND SOUND, BURGLAR ALARMS,
FIRE ALARM (SEE LAST PARAGRAPH BELOW) AND LOW
VOLTAGE MASTER CLOCK SYSTEMS IN COMMERCIAL
BUILDINGS. COMMUNICATION SYSTEMS THAT TRANSMIT OR
RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE
INTRINSIC TO THE ABOVE LISTED SYSTEMS; INCLUSION OR
EXCLUSION OF TERMINATIONS AND TESTINGS OF
CONDUCTORS DETERMINED BY THEIR FUNCTION; EXCLUDING
ALL OTHER DATA SYSTEMS OR MULTIPLE SYSTEMS WHICH
INCLUDE CONTROL FUNCTION OR POWER SUPPLY; EXCLUDING
INSTALLATION OF RACEWAY SYSTEMS, CONDUIT SYSTEMS,
LINE VOLTAGE WORK, AND ENERGY MANAGEMENT SYSTEMS.
FIRE ALARM WORK SHALL BE PERFORMED AT THE CURRENT
INSIDE WIREMAN TOTAL COST PACKAGE.....\$ 52.39

21.21

COMMUNICATIONS SYSTEM: INSTALLER (CHINA LAKE NAVAL
WEAPONS CENTER) COMMUNICATIONS AND SYSTEMS WORK
SCOPE OF WORK: INSTALLATION, TESTING, SERVICE
AND MAINTENANCE OF SYSTEMS UTILIZING THE
TRANSMISSION AND/OR TRANSFERENCE OF VOICE, SOUND,
VISION AND DIGITAL FOR COMMERCIAL, EDUCATIONAL,
SECURITY AND ENTERTAINMENT PURPOSES FOR THE
FOLLOWING: TV MONITORING AND SURVEILLANCE,
BACKGROUND-FOREGROUND MUSIC, INTERCOM AND TELEPHONE
INTERCONNECT, INVENTORY CONTROL SYSTEMS, MICROWAVE
TRANSMISSION, MULTI-MEDIA, MULTIPLEX, NURSE CALL
SYSTEMS, RADIO PAGE, SCHOOL INTERCOM AND SOUND,
BURGLAR ALARMS, FIRE ALARM (SEE LAST PARAGRAPH
BELOW) AND LOW VOLTAGE MASTER CLOCK SYSTEMS IN
COMMERCIAL BUILDINGS. COMMUNICATION SYSTEMS THAT
TRANSMIT OR RECEIVE INFORMATION AND/OR CONTROL
SYSTEMS THAT ARE INTRINSIC TO THE ABOVE LISTED
SYSTEMS; INCLUSION OR EXCLUSION OF TERMINATIONS AND

TESTINGS OF CONDUCTORS DETERMINED BY THEIR
FUNCTION; EXCLUDING ALL OTHER DATA SYSTEMS OR
MULTIPLE SYSTEMS WHICH INCLUDE CONTROL FUNCTION OR
POWER SUPPLY; EXCLUDING INSTALLATION OF RACEWAY
SYSTEMS, CONDUIT SYSTEMS, LINE VOLTAGE WORK, AND
ENERGY MANAGEMENT SYSTEMS. FIRE ALARM WORK SHALL
BE PERFORMED AT THE CURRENT INSIDE WIREMAN TOTAL
COST PACKAGE.....\$ 55.90
21.32

ELEC0477-001 06/01/2024

Rates

Fringes
ELECTRICIAN (INYO AND MONO) CABLE SPLICER:
\$1.50 ABOVE ELECTRICIAN. TUNNEL WORK: 10% ABOVE
ELECTRICIAN. ZONE PAY: ZONE A - 80 ROAD MILES
FROM POST OFFICE, 455 ORANGE SHOW LANE, SAN
BERNARDINO, WILL BE A FREE ZONE FOR ALL CONTRACTORS
ZONE B - ANY WORK PERFORMED OUTSIDE ZONE A'S 80
ROAD MILES, SHALL ADD \$12.00 PER HOUR TO THE
CURRENT WAGE SCALE.....\$ 53.15
29.07

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

ELEV0018-001 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.....\$ 69.43
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 following 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 following 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 following 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 following 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 following 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 following 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, PILEDIVING & 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, PILEDIVING & 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 FOLLOWING 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, PILEDIVING & 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 FOLLOWING 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, PILEDIVING &
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, PILEDIVING &
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, PILEDIVING &
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 FOLLOWING 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, PILEDIVING & 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 FOLLOWING 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, PILEDIVING & 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 FOLLOWING 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, PILEDIVING &
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, PILEDIVING &
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, PILEDIVING &
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 FOLLOWING
 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
 FOLLOWING 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 FOLLOWING 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 FOLLOWING 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 FOLLOWING 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 THAN 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 FOLLOWING 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 FOLLOWING 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

IRON0155-002 01/01/2025

Rates

Fringes
IRONWORKER (INYO AND MONO COUNTIES).....\$ 43.75
34.45

IRON0155-003 01/01/2025

Rates

Fringes
IRONWORKER (KERN COUNTY).....\$ 50.70
35.15

LABO0220-002 07/01/2025

Rates

Fringes
LABORER, TUNNEL: GROUP 4 GROUP 4: DIAMOND DRILLER;
SANDBLASTER; SHAFT AND RAISE WORK (KERN COUNTY)....\$ 55.07
25.74
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 (KERN COUNTY)....\$ 54.38
25.74

LABORER, TUNNEL: GROUP 2: CHUCKTENDER, CABLETENDER;
LOADING AND UNLOADING AGITATOR CARS; VIBRATOR
PERSON, JACK HAMMER, PNEUMATIC TOOLS (EXCEPT
DRILLER); BULL GANG MUCKER, TRACK PERSON; CONCRETE
CREW, INCLUDING RODDER AND SPREADER (KERN COUNTY)..\$ 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.) (KERN COUNTY).....\$ 53.60
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
(KERN COUNTY).....\$ 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 (KERN COUNTY).....\$ 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 (KERN COUNTY).....\$ 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

BELLLOWER (KERN COUNTY)\$ 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
(KERN COUNTY)\$ 46.48
25.95

LABO0220-005 11/01/2025

Rates

Fringes

BRICK TENDER (KERN COUNTY)\$ 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

LABO0783-001 07/01/2025

Rates

Fringes

LABORER, TUNNEL: GROUP 4: DIAMOND DRILLER;
SANDBLASTER; SHAFT AND RAISE WORK (INYO AND MONO
COUNTIES).....\$ 55.07
25.74

LABORER, TUNNEL: GROUP 3 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 (INYO
AND MONO COUNTIES).....\$ 54.38
25.74

LABORER, TUNNEL: GROUP 2: CHUCKTENDER, CABLETENDER;
LOADING AND UNLOADING AGITATOR CARS; VIBRATOR
PERSON, JACK HAMMER, PNEUMATIC TOOLS (EXCEPT
DRILLER); BULL GANG MUCKER, TRACK PERSON; CONCRETE
CREW, INCLUDING RODDER AND SPREADER (INYO AND MONO
COUNTIES).....\$ 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.) (INYO AND MONO COUNTIES)\$ 53.60
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 (INYO AND MONO COUNTIES).....\$ 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 (INYO AND MONO COUNTIES).....\$ 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 (INYO AND MONO COUNTIES).....\$ 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 BELLLOWER (INYO AND MONO COUNTIES).....\$ 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
(INYO AND MONO COUNTIES).....\$ 46.48
25.95

LABO0783-004 11/01/2025

Rates

Fringes
BRICK TENDER (INYO AND MONO COUNTIES).....\$ 42.60
22.13

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	

PAIN0036-009 09/01/2024

Rates

Fringes	
DRYWALL FINISHER/TAPER.....	\$ 45.20
26.82	

PAIN0036-021 07/01/2023

Rates

Fringes	
PAINTERS: INCLUDING LEAD ABATEMENT: (5) INDUSTRIAL..	\$ 41.42
19.04	
PAINTERS: INCLUDING LEAD ABATEMENT: (4) ALL OTHER	
WORK.....	\$ 34.08
18.50	
PAINTERS: INCLUDING LEAD ABATEMENT: (1) JOURNEYMAN	
PAINTER.....	\$ 34.08
18.50	

PAIN0169-002 01/01/2023

Rates

Fringes	
GLAZIER.....	\$ 44.33
28.88	

PAIN1247-001 01/01/2025

Rates

Fringes	
SOFT FLOOR LAYER.....	\$ 45.15
19.43	

 PLAS0200-007 08/03/2022

Rates

Fringes

PLASTERER U.S. MARINE CORPS-PICKLE MEADOW &
 MOUNTAIN WARFARE TRAINING CENTER: \$3.00 ADDITIONAL
 PER HOUR.....\$ 47.37
 19.64

PLAS0500-002 07/01/2025

Rates

Fringes

CEMENT MASON/CONCRETE FINISHER.....\$ 47.70
 27.07

PLUM0345-001 09/01/2025

Rates

Fringes

PLUMBER (SEWER & STORM DRAIN WORK).....\$ 48.84
 23.58
 PLUMBER (LANDSCAPE/IRRIGATION FITTER).....\$ 44.75
 26.20

PLUM0460-002 09/01/2025

Rates

Fringes

PLUMBER: PLUMBER, PIPEFITTER, STEAMFITTER,
 REFRIGERATION: EDWARDS AIR FORCE BASE FOOTNOTE:
 WORK FROM A SWINGING SCAFFOLD, SWINGING BASKET,
 SPIDER OR FROM A BOSUN CHAIR: 10% ABOVE THE REGULAR
 RATE OF PAY FOR THAT DAY.....\$ 68.73
 26.81
 PLUMBER: PLUMBER, PIPEFITTER, STEAMFITTER,
 REFRIGERATION: CHINA LAKE, MARINE WARFARE TRAINING
 CENTER FOOTNOTE: WORK FROM A SWINGING SCAFFOLD,
 SWINGING BASKET, SPIDER OR FROM A BOSUN CHAIR: 10%
 ABOVE THE REGULAR RATE OF PAY FOR THAT DAY.....\$ 72.23
 26.81
 PLUMBER: PLUMBER, PIPEFITTER, STEAMFITTER,
 REFRIGERATION: ALL OTHER WORK FOOTNOTE: WORK
 FROM A SWINGING SCAFFOLD, SWINGING BASKET, SPIDER
 OR FROM A BOSUN CHAIR: 10% ABOVE THE REGULAR RATE
 OF PAY FOR THAT DAY.....\$ 61.73
 26.81

ROOF0027-001 09/01/2024

Rates

Fringes

ROOFER FOOTNOTE: WORK WITH PITCH, PITCH BASE OF
PITCH IMPREGNATED PRODUCTS OR ANY MATERIAL
CONTAINING COAL TAR PITCH, ON ANY BUILDING OLD OR
NEW, WHERE BOTH ASPHALT AND PITCHERS ARE USED IN
THE APPLICATION OF A BUILT-UP ROOF OR TEAR OFF:
\$2.00 PER HOUR ADDITIONAL.....\$ 45.76
16.86

SFCA0669-007 01/01/2026

Rates

Fringes

SPRINKLER FITTER.....\$ 50.79
29.80

SHEE0105-003 01/01/2025

Rates

Fringes

SHEET METAL WORKER: (1) COMMERCIAL - NEW
CONSTRUCTION AND REMODEL WORK (LOS ANGELES (SOUTH
OF A STRAIGHT LINE DRAWN BETWEEN GORMAN AND BIG
PINES)AND CATALINA ISLAND, INYO, KERN (NORTHEAST
PART, EAST OF HWY 395), MONO ORANGE, RIVERSIDE, AND
SAN BERNARDINO COUNTIES).....\$ 59.31
30.43

SHEE0105-004 07/01/2023

Rates

Fringes

SHEET METAL WORKER (KERN (EXCLUDING PORTION EAST
OF HWY 395) & LOS ANGELES (NORTH OF A STRAIGHT LINE
DRAWN BETWEEN GORMAN AND BIG PINES INCLUDING CITIES
OF LANCASTER AND PALMDALE) COUNTIES).....\$ 45.98
29.24

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?, ?JAVG?, ?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"

STATE WAGE RATES

GENERAL PREVAILING WAGE DETERMINATION MADE BY
THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: OPERATING ENGINEER[#]

Determination:

SC-23-63-2-2026-1

Issue Date:

February 22, 2026

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara and Ventura Counties.

Wages and total hourly rates (including employer payments):

Classification ^a (Journey person)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^c (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group 1	\$63.40	8	\$98.75	\$130.450	\$130.450	\$162.15
Group 2	\$64.18	8	\$99.53	\$131.620	\$131.620	\$163.71
Group 3	\$64.47	8	\$99.82	\$132.055	\$132.055	\$164.29
Group 4	\$65.96	8	\$101.31	\$134.290	\$134.290	\$167.27
Group 6	\$66.18	8	\$101.53	\$134.620	\$134.620	\$167.71
Group 8	\$66.29	8	\$101.64	\$134.785	\$134.785	\$167.93
Group 10	\$66.41	8	\$101.76	\$134.965	\$134.965	\$168.17
Group 12	\$66.58	8	\$101.93	\$135.220	\$135.220	\$168.51
Group 13	\$66.68	8	\$102.03	\$135.370	\$135.370	\$168.71
Group 14	\$66.71	8	\$102.06	\$135.415	\$135.415	\$168.77
Group 15	\$66.79	8	\$102.14	\$135.535	\$135.535	\$168.93
Group 16	\$66.91	8	\$102.26	\$135.715	\$135.715	\$169.17
Group 17	\$67.08	8	\$102.43	\$135.970	\$135.970	\$169.51
Group 18	\$67.18	8	\$102.53	\$136.120	\$136.120	\$169.71
Group 19	\$67.29	8	\$102.64	\$136.285	\$136.285	\$169.93
Group 20	\$67.41	8	\$102.76	\$136.465	\$136.465	\$170.17
Group 21	\$67.58	8	\$102.93	\$136.720	\$136.720	\$170.51
Group 22	\$67.68	8	\$103.03	\$136.870	\$136.870	\$170.71
Group 23	\$67.79	8	\$103.14	\$137.035	\$137.035	\$170.93
Group 24	\$67.91	8	\$103.26	\$137.215	\$137.215	\$171.17
Group 25	\$68.08	8	\$103.43	\$137.470	\$137.470	\$171.51

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$15.20
Pension ^d	\$15.65
Vacation and Holiday ^e	\$2.95
Training	\$1.10
Other	\$0.45

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY
THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: OPERATING ENGINEER (SPECIAL SHIFT) #

Determination:

SC-23-63-2-2026-1

Issue Date:

February 22, 2026

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara and Ventura Counties.

Wages and total hourly rates (including employer payments):

Classification ^a (Journey person)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^c (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group 1	\$64.40	8	\$99.75	\$131.950	\$131.950	\$164.15
Group 2	\$65.18	8	\$100.53	\$133.120	\$133.120	\$165.71
Group 3	\$65.47	8	\$100.82	\$133.555	\$133.555	\$166.29
Group 4	\$66.96	8	\$102.31	\$135.790	\$135.790	\$169.27
Group 6	\$67.18	8	\$102.53	\$136.120	\$136.120	\$169.71
Group 8	\$67.29	8	\$102.64	\$136.285	\$136.285	\$169.93
Group 10	\$67.41	8	\$102.76	\$136.465	\$136.465	\$170.17
Group 12	\$67.58	8	\$102.93	\$136.720	\$136.720	\$170.51
Group 13	\$67.68	8	\$103.03	\$136.870	\$136.870	\$170.71
Group 14	\$67.71	8	\$103.06	\$136.915	\$136.915	\$170.77
Group 15	\$67.79	8	\$103.14	\$137.035	\$137.035	\$170.93
Group 16	\$67.91	8	\$103.26	\$137.215	\$137.215	\$171.17
Group 17	\$68.08	8	\$103.43	\$137.470	\$137.470	\$171.51
Group 18	\$68.18	8	\$103.53	\$137.620	\$137.620	\$171.71
Group 19	\$68.29	8	\$103.64	\$137.785	\$137.785	\$171.93
Group 20	\$68.41	8	\$103.76	\$137.965	\$137.965	\$172.17
Group 21	\$68.58	8	\$103.93	\$138.220	\$138.220	\$172.51
Group 22	\$68.68	8	\$104.03	\$138.370	\$138.370	\$172.71
Group 23	\$68.79	8	\$104.14	\$138.535	\$138.535	\$172.93
Group 24	\$68.91	8	\$104.26	\$138.715	\$138.715	\$173.17
Group 25	\$69.08	8	\$104.43	\$138.970	\$138.970	\$173.51

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$15.20
Pension ^d	\$15.65
Vacation and Holiday ^e	\$2.95
Training	\$1.10
Other	\$0.45

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY
THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: OPERATING ENGINEER (MULTI-SHIFT)#

Determination:

SC-23-63-2-2026-1

Issue Date:

February 22, 2026

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara and Ventura Counties.

Wages and total hourly rates (including employer payments):

Classification ^a (Journey person)	Basic Hourly Rate	Hours ^f	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^c (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group 1	\$64.40	8	\$99.75	\$131.950	\$131.950	\$164.15
Group 2	\$65.18	8	\$100.53	\$133.120	\$133.120	\$165.71
Group 3	\$65.47	8	\$100.82	\$133.555	\$133.555	\$166.29
Group 4	\$66.96	8	\$102.31	\$135.790	\$135.790	\$169.27
Group 5	\$67.06	8	\$102.41	\$135.940	\$135.940	\$169.47
Group 6	\$67.18	8	\$102.53	\$136.120	\$136.120	\$169.71
Group 7	\$67.28	8	\$102.63	\$136.270	\$136.270	\$169.91
Group 8	\$67.29	8	\$102.64	\$136.285	\$136.285	\$169.93
Group 9	\$67.39	8	\$102.74	\$136.435	\$136.435	\$170.13
Group 10	\$67.41	8	\$102.76	\$136.465	\$136.465	\$170.17
Group 11	\$67.51	8	\$102.86	\$136.615	\$136.615	\$170.37
Group 12	\$67.58	8	\$102.93	\$136.720	\$136.720	\$170.51
Group 13	\$67.68	8	\$103.03	\$136.870	\$136.870	\$170.71
Group 14	\$67.71	8	\$103.06	\$136.915	\$136.915	\$170.77
Group 15	\$67.79	8	\$103.14	\$137.035	\$137.035	\$170.93
Group 16	\$67.91	8	\$103.26	\$137.215	\$137.215	\$171.17
Group 17	\$68.08	8	\$103.43	\$137.470	\$137.470	\$171.51
Group 18	\$68.18	8	\$103.53	\$137.620	\$137.620	\$171.71
Group 19	\$68.29	8	\$103.64	\$137.785	\$137.785	\$171.93
Group 20	\$68.41	8	\$103.76	\$137.965	\$137.965	\$172.17
Group 21	\$68.58	8	\$103.93	\$138.220	\$138.220	\$172.51
Group 22	\$68.68	8	\$104.03	\$138.370	\$138.370	\$172.71
Group 23	\$68.79	8	\$104.14	\$138.535	\$138.535	\$172.93
Group 24	\$68.91	8	\$104.26	\$138.715	\$138.715	\$173.17

Classification ^a (Journey person)	Basic Hourly Rate	Hours ^f	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^c (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group 25	\$69.08	8	\$104.43	\$138.970	\$138.970	\$173.51

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$15.20
Pension ^d	\$15.65
Vacation and Holiday ^e	\$2.95
Training	\$1.10
Other	\$0.45

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Classifications:

Group 1

Bargeman
Brakeman
Compressor Operator
Ditchwitch, 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
Heavy Duty Repairman Helper
Inertial Profiler Operator
Pump Operator
Signalman
Switchman

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 Dump Jack
Rotary Drill Helper (Oilfield)
Screening and Conveyor Machine Operator (or similar types)
Skiploader (Wheel type up to $\frac{3}{4}$ yd. without attachment)
Tar Pot Fireman
Temporary Heating Plant Operator
Trenching Machine Oiler

Group 3

Asphalt Rubber Blend Operator
Bobcat or similar type (Skid Steer, with all attachments)
Equipment Greaser (rack)
Ford Ferguson (with dragtype attachments)
Helicopter Radioman (ground)

Stationary Pipe Wrapping and Cleaning Machine Operator

Group 4

Asphalt Plant Fireman
Backhoe Operator (mini-max or similar type)
Boring Machine Operator
Boring System Electronic Tracking Locator
Boxman or Mixerman (asphalt or concrete)
Chip Spreading Machine Operator
Concrete Cleaning Decontamination Machine Operator
Concrete Pump Operator (small portable)
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)
Excavator Track/Rubber-Tired-with all attachments (Operating weight under 21,000 lbs)
Guard Rail Post Driver Operator
Highline Cableway Signalman
Hydra-Hammer-Aero Stomper
Hydraulic Casing Oscillator Operator – drilling depth of 30' maximum
Micro Tunneling Operator (above ground tunnel)
Power Concrete Curing Machine Operator
Power Concrete Saw Operator
Power – Driver 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 Muck Truck

Group 5 (for multi-shift rate, see Pages 5 and 6)

Equipment Greaser (Grease Truck/Multi-Shift)

Group 6

Articulating Material Hauler
Asphalt Plant Engineer
Batch Plant Operator
Bit Sharpener
Concrete Joint Machine Operator (canal and similar type)
Concrete Placer Operator
Concrete Planer Operator

Dandy Digger
Deck Engine Operator
Deck Engineer
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 (including water wells)
Forced Feed Loader
Hydraulic Casing Oscillator Operator – drilling depth
of 45' maximum
Hydro Seeder Machine Operator (straw, pulp or seed)
Jackson Track Maintainer, 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 types)
Micro Tunnel System Operator (below ground)
Pavement Breaker Operator
Railcar Mover
Road Oil Mixing Machine Operator
Roller Operator (asphalt or finish)
Rubber-Tired Earthmoving Equipment (single
engine, up to and including 25 yds. struck)
Self-Propelled Tar Pipelining Machine Operator
Skiploader Operator (crawler and wheel type, over
¾ yds. and up to and including 1½ 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
Volumetric Mixer Operator
Welder - General

Group 7 (for multi-shift rate, see Pages 5 and 6)

Welder - General (Multi-Shift)

Group 8

Allroad Mobile Timber Harvester (Albach or similar
types)
Asphalt or Concrete Spreading Operator (tamping or
finishing)
Asphalt Paving Machine Operator (barber greene or
similar type, one (1) Screedman)
Asphalt-Rubber Distributor Operator
Backhoe Operator (up to and including ¾ yds.)
small ford, case or similar types
Backhoe Operator (over ¾ yd. and up to 5 cu. yds.
M.R.C.)
Barrier Rail Mover (BTM Series 200 or similar types)
Cast in Place Pipe Laying Machine Operator
Cold Foamed Asphalt Recycler
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
Excavator Track/Rubber-Tired with all attachments
(Operating Weight 21,000 lbs – 100,000 lbs)
Global Positioning System/GPS (or Technician)
Grade Checker
Gradall Operator
Grouting Machine Operator
Heavy Duty Repairman/Pump Installer
Heavy Equipment Robotics Operator
Hydraulic Casing Oscillator Operator – drilling depth
of 60' maximum
Hydraulic Operated Grout Plant (excludes hand
loading)
Kalamazoo Ballast Regulator or similar type
Kalamazoo Switch Tamper, or similar type
Klemm Drill Operator or similar types
Kolman Belt Loader and similar type
Le Tourneau Blob Compactor or similar type
Lo Drill
Loader Operator (Athey, Euclid, Sierra and similar
types)

Master Environmental Maintenance Mechanic
Mobark Chipper or similar types
Ozzie Padder or similar types
P.C. 490 Slot Saw
Pneumatic Concrete Placing Machine Operator
(Hackley-Presswell or similar type)
Prentice 721E Hydro-Ax
Pumpcrete Gun Operator
Rail Tie Crane (Kershaw or similar types)
Rock Drill or Similar Types (see Miscellaneous
Provision #4 for additional information regarding
this classification)
Rotary Drill Operator (excluding caison type)
Rubber-Tired Earth Moving Equipment Operator
(single engine, caterpillar, euclid, atthey 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
(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
½ yds. up to and including 6 ½ yds.)
Soil Remediation Plant Operator (CMI, Envirotech or
Similar types)
Soil Stabilizer and Reclaimer (WR-2400)
Somero SXP Laser Screed
Speed Swing Operator
Surface Heaters and Planer Operator
Tractor Compressor Drill Combination Operator
Tractor Operator (any type larger than D-5 – 100
flyweel H.P. and over, or similar types –
bulldozer, tamper, scraper and push tractor,
single engine)
Tractor Operator (boom attachments)
Traveling Pipe Wrapping, Cleaning and Bending
Machine Operator)
Trenching Machine Operator (over 6 ft. depth
capacity, manufacturer's rating)
Trenching Machine with Road Miner Attachment
(over 6ft. depth capacity, manufacturer's rating –
Oiler or Journeyman Trainee required)

Ultra High Pressure Waterjet Cutting Tool System
Mechanic
Water Pull (compaction)

Group 9 (for multi-shift rate, see Pages 5 and 6)
Heavy Duty Repairman (Multi-Shift)

Group 10

Backhoe Operator (over 5 cu. yds. M.R.C.)
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
Heavy Duty Repairman-Welder combination
Hydraulic Casing Oscillator Operator – drilling depth
of 105' maximum
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.)
Pneumatic Pipe Ramming Tool and similar types
Pre-stressed Wrapping Machine Operator (2
Operators required)
Production Tamper - Harsco or similar types
Rail Dynamic Stabilizer
Rubber – Tired Earth Moving Equipment Operator
(single engine, over 50 yds. struck)
Rubber – Tired Earth Moving Equipment Operator
(multiple engine, euclid caterpillar and similar
types – over 25 yds. and up to 50 yds. struck)
Tower Crane Repairman
Tractor Loader Operator (crawler and wheel-type
over 6 ½ yds.)
Unmanned Aircraft Systems (UAS Drones) Operator
(when used in conjunction with hoisting and
placing materials)
Welder – Certified
Woods Mixer Operator (and similar pugmill
equipment)

Group 11 (for multi-shift rate, see Pages 5 and 6)
Heavy Duty Repairman – Welder Combination
(Multi-Shift)
Welder – Certified (Multi-Shift)

Group 12

Auto Grader Operator

Automatic Slip Form Operator

Backhoe Operator (over 7 cu. yds. M.R.C.)

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)

Excavator Track/Rubber Tired- with all attachments
(Operating Weight 100,000 lbs. – 200,000 lbs.)

Hoe Ram or similar types with compressor

Hydraulic Casing Oscillator Operator – drilling depth
of 175' maximum

Mass Excavator Operator – less than 750 cu. yds.

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)

Group 13

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Push-Pull System
(single engine, up to and including 25 yds. struck)

Group 14

Canal Liner Operator

Canal Trimmer 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 300' maximum)

Remote Controlled Earth Moving Operator (\$1.00
per hour additional to base rate)

Wheel Excavator Operator (over 750 cu. yds. per
hour)

Group 15

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Push-Pull System

(single engine, caterpillar, euclid, atthey wagon,
and similar types with any and all attachments
over 25 and up to and including 50 cu. yds.
struck)

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Push-Pull System
(multiple engine - up to and including 25 yds.
struck)

Group 16

Excavator Track/Rubber Tired – with all attachments
(Operating Weight exceeding 200,000 lbs.)

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Push-Pull System
(single engine, over 50 yds. struck)

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Push-Pull System
(multiple engine, euclid, caterpillar, and similar,
over 25 yds. and up to 50 yds. struck)

Group 17

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Push-Pull System
(multiple engine, euclid, caterpillar, and similar
type, over 50 cu. yds. struck)

Tandem Tractor Operator (operating crawler type
tractors in tandem – Quad 9 and similar type)

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)

Group 19

Rotex Concrete Belt Operator

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, atthey 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 engines, up to and
including 25 yds. struck)

Group 20

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)

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)

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)

Group 23

MISCELLANEOUS PROVISIONS:

1. Operators on hoists with three drums shall receive fifty cents (50¢) per hour additional pay to the regular rate of pay. The additional pay shall be added to the regular rate and become the base rate for the entire shift.
2. All heavy duty repairman and heavy duty combination shall receive one dollar (\$1.00) per hour tool allowance in addition to their regular rate of pay and this shall become their base rate of pay.
3. Employees required to suit up and work in a hazardous material environment, shall receive Two Dollars (\$2.00) per hour in addition to their regular rate of pay, and that rate shall become the basic hourly rate of pay.
4. A review of rock drilling is currently pending. The minimum acceptable rate of pay for this classification or type of work on public works projects is Laborer and Related Classifications/Group 5 (Driller) as published in the Director's General Prevailing Wage Determinations. However, the published rate for the craft/classification of Operating Engineer/Group 8 (Rock Drill or Similar Types) may be used by contractors to perform rock drilling on public works projects.

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Tandem Push-Pull
System (single engine, caterpillar, euclid, atthey
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 Equipment with the Tandem Push-Pull
System (multiple engine, up to and including 25
yds. struck)

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)

Group 25

Concrete Pump Operator-Truck Mounted
Pedestal Concrete Pump Operator

Rubber-Tired Earth Moving Equipment Operator,
Operating Equipment with the Tandem Push-Pull
System (multiple engine, euclid, caterpillar and
similar over 50 cu. yds struck)

Indicates an apprenticeable craft. The current apprentice wage rates are available on the [Prevailing Wage Apprentice Determinations Website](http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp) (<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>).

^a For classifications within each group, see Pages 7 through 11.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d Includes an amount for Annuity.

^e Includes an amount withheld for supplemental dues.

^f The Third Shift shall work 6.5 hours, exclusive of meal period, for which 8 hours straight-time shall be paid at the non-shift rate, Monday through Friday.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

Craft: Laborer and Related Classifications #

Determination:

SC-23-102-2-2025-1

Issue Date:

August 22, 2025

Expiration date of determination:

June 30, 2026* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Office of the Director – Research Unit at (415) 703-4774 for the new rates after 10 days from the expiration date, if no subsequent determination is issued.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

Wages and Employer Payments:

Classification ^a (Journey person)	Basic Hourly Rate	Health and Welfare	Pension	Vacation and Holiday ^b	Training	Other	Hours	Total Hourly Rate	Daily Overtime Hourly Rate (1 ½ X) ^c	Saturday Overtime Hourly Rate (1 ½ X) ^{cd}	Sunday/ Holiday Overtime Hourly Rate (2 X)
Group 1	\$46.48	\$9.55	\$12.57	\$5.02	\$0.80	\$0.67	8.0	\$75.09	\$98.330	\$98.330	\$121.570
Group 2	\$47.03	\$9.55	\$12.57	\$5.02	\$0.80	\$0.67	8.0	\$75.64	\$99.155	\$99.155	\$122.670
Group 3	\$47.58	\$9.55	\$12.57	\$5.02	\$0.80	\$0.67	8.0	\$76.19	\$99.980	\$99.980	\$123.770
Group 4	\$49.13	\$9.55	\$12.57	\$5.02	\$0.80	\$0.67	8.0	\$77.74	\$102.305	\$102.305	\$126.870
Group 5	\$49.48	\$9.55	\$12.57	\$5.02	\$0.80	\$0.67	8.0	\$78.09	\$102.830	\$102.830	\$127.570

Group 1

Boring Machine Helper (Outside)
Certified Confined Space Laborer
Cleaning and Handling of Panel Forms
Concrete Screeding for Rough Strike-Off
Concrete, Water Curing
Demolition Laborer, the cleaning of brick if performed by an employee performing any other phase of demolition work, and the cleaning of lumber
Fiberoptic Installation, Blowing, Splicing, and Testing Technician on public right-of-way only
Fire Watcher, Limbers, Brush Loaders, Pilers and Debris Handlers
Flagman
Gas, Oil and/or Water Pipeline Laborer
Laborer, Asphalt-Rubber Material Loader
Laborer, General or Construction
Laborer, General Cleanup
Laborer, Jetting
Laborer, Temporary Water and Air Lines
Plugging, Filling of Shee-Bolt Holes; Dry Packing of Concrete and Patching
Post Hole Digger (Manual)
Railroad Maintenance, Repair Trackman and Road Beds; Streetcar and Railroad Construction Track Laborers
Rigging and Signaling
Scaler
Slip Form Raisers
Tarman and Mortar Man
Tool Crib or Tool House Laborer
Traffic Control by any method
Water Well Driller Helper
Window Cleaner
Wire Mesh Pulling - All Concrete Pouring Operations

Group 2

Asphalt Shoveler
Cement Dumper (on 1 yard or larger mixer and handling bulk cement)
Cesspool Digger and Installer
Chucktender
Chute Man, pouring concrete, the handling of the chute from readymix trucks, such as walls, slabs, decks,

floors, foundations, 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 Man
Guinea Chaser
Headerboard Man-Asphalt
Installation of all Asphalt Overlay Fabric and Materials used for Reinforcing Asphalt
Laborer, Packing Rod Steel and Pans
Membrane Vapor Barrier Installer
Power Broom Sweepers (small)
Riprap, Stonepaver, placing stone or wet sacked concrete
Roto Scraper and Tiller
Sandblaster (Pot Tender)
Septic Tank Digger and Installer (leadman)
Tank Scaler and Cleaner
Tree Climber, Faller, Chain Saw Operator, Pittsburgh Chipper and similar type Brush Shredders
Underground Laborer, including Caisson Bellow

Group 3

Asphalt Installation of all fabrics
Buggymobile Man
Compactor (all types including Tampers, Barko, Wacker)
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-inch pipe and over by any method, inside and out
Impact Wrench, Multi-Plate
Kettlemen, Potmen and Men applying asphalt, lay-kold, creosote, lime caustic and similar type materials
Laborer, Fence Erector
Material Hoseman (Walls, Slabs, Floors and Decks)
Operators of Pneumatic, Gas, Electric Tools, Vibrating Machines, Pavement Breakers, Air Blasting, Come-

Alongs, and similar mechanical tools not separately classified herein; operation of remote controlled robotic tools in connection with Laborers work
Pipelayer's backup man, coating, grouting, making of joints, sealing, caulking, diapering and including rubber gasket joints, pointing and any and all other services
Power Post Hole Digger
Rock Slinger
Rotary Scarifier or Multiple Head Concrete Chipping Scarifier
Steel Headerboard Man and Guideline Setter
Trenching Machine, Hand Propelled

Group 4

Any Worker Exposed to Raw Sewage
Asphalt Raker, Luteman, Ironer, Asphalt Dumpman, and Asphalt Spreader Boxes (all types)
Concrete Core Cutter (walls, floors or ceilings), Grinder or Sander
Concrete Saw Man, Cutting Walls or Flat Work, Scoring old or new concrete
Cribber, Shorer, Lagging, Sheeting and Trench Bracing, Hand-Guided Lagging Hammer
Head Rock Slinger
High Scaler (including drilling of same)
Laborer, Asphalt-Rubber Distributor Bootman
Laser Beam in connection with Laborer's work
Oversize Concrete Vibrator Operator, 70 pounds and over
Pipelayer
Prefabricated Manhole Installer
Sandblaster (Nozzleman), Water Blasting, Porta Shot-Blast
Subsurface Imaging Laborer
Traffic Lane Closure, certified

Group 5

Blasters Powderman
Driller
Toxic Waste Removal
Welding, certified or otherwise in connection with Laborers' work

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Indicates an apprenticeable craft. The current apprentice wage rates are available on the [Prevailing Wage Apprentice Determinations Website](http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp) (<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>).

^a For classification within each group, see page 2.

^b Includes an amount per hour worked for supplemental dues.

^c Any hours worked over 12 hours in a single workday are double (2) time.

^d Saturdays in the same work week may be worked at straight-time if job is shut down during work week due to inclement weather or similar Act of God, or a situation beyond the employer's control.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

Craft: Cement Mason[#]

Determination:

SC-23-203-2-2025-1

Issue Date:

August 22, 2025

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura Counties.

Wages and Employer Payments:

Classification (Journey person)	Basic Hourly Rate	Health and Welfare	Pension	Vacation and Holiday ^a	Training	Other	Hours	Total Hourly Rate	Daily Overtime Hourly Rate (1 ½ X) ^b	Saturday Overtime Hourly Rate (1 ½ X) ^b _c	Sunday/ Holiday Overtime Hourly Rate (2 X)
Cement Mason, Curb and Gutter Machine Operator; Clary and Similar Type of Screed Operator (Cement only); Grinding Machine Operator (all types); Jackson Vibratory, Texas Screed and Similar Type Screed Operator; Scoring Machine Operator	\$47.70	\$9.08	\$12.35	\$7.52	\$0.64	\$0.24	8.0	\$77.53	\$101.38	\$101.38	\$125.230
Magnesite, magnesite-terrazzo and mastic composition, Epoxy, Urethanes and exotic coatings, Dex-O-Tex	\$47.82	\$9.08	\$12.35	\$7.52	\$0.64	\$0.24	8.0	\$77.65	\$101.56	\$101.56	\$125.470

Classification (Journey person)	Basic Hourly Rate	Health and Welfare	Pension	Vacation and Holiday ^a	Training	Other	Hours	Total Hourly Rate	Daily Overtime Hourly Rate (1 ½ X) ^b	Saturday Overtime Hourly Rate (1 ½ X) ^b _c	Sunday/ Holiday Overtime Hourly Rate (2 X)
Floating and Troweling Machine Operator	\$48.70	\$9.08	\$12.35	\$7.52	\$0.64	\$0.24	8.0	\$78.53	\$102.880	\$102.880	\$127.230

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Indicates an apprenticeable craft. The current apprentice wage rates are available on the [Prevailing Wage Apprentice Determinations Website](http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp) (<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>).

^a Includes an amount for supplemental dues.

^b Rate applies to the first 4 daily overtime hours and the first 12 hours worked on Saturday. All other time is paid at the double time (2X) rate.

^c Saturday in the same work week may be worked at straight-time rate, up to 8 hours on Saturday or when the employee has worked a total of 40 hours in the work week, if it is not reasonably possible for any individual employee on a particular job site to complete 40 hours of work on a 8 hour day, Monday through Friday, due to inclement weather or similar act of God or a situation beyond the control of the contractor.

GENERAL PREVAILING WAGE DETERMINATION MADE BY
THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #TEAMSTER (APPLIES ONLY TO WORK ON THE CONSTRUCTION SITE)

Determination:

SC-23-261-2-2025-1

Issue Date:

August 22, 2025

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura Counties.

Wages and total hourly rates (including employer payments):

Classification ^a (Journey person)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^b (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group I	\$41.59	8	\$78.54	\$99.335	\$99.335	\$120.13
Group II	\$41.74	8	\$78.69	\$99.56	\$99.56	\$120.43
Group III	\$41.87	8	\$78.82	\$99.755	\$99.755	\$120.69
Group IV	\$42.06	8	\$79.01	\$100.04	\$100.04	\$121.07
Group V	\$42.09	8	\$79.04	\$100.085	\$100.085	\$121.13
Group VI	\$42.12	8	\$79.07	\$100.13	\$100.13	\$121.19
Group VII	\$42.37	8	\$79.32	\$100.505	\$100.505	\$121.69
Group VIII	\$42.62	8	\$79.57	\$100.88	\$100.88	\$122.19
Group IX	\$42.82	8	\$79.77	\$101.18	\$101.18	\$122.59
Group X	\$43.12	8	\$80.07	\$101.63	\$101.63	\$123.19
Group XI	\$43.62	8	\$80.57	\$102.38	\$102.38	\$124.19

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$20.37
Pension	\$9.00
Vacation and Holiday ^c	\$4.95
Training	\$2.02
Other	\$0.61

Wages and total hourly rates (including employer payments):

Classification ^d (Subjourneyman)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^b (1½x)	Sunday/Holiday Overtime Hourly Rate (2 x)
0-2000 hours	\$27.80	8	\$63.60	\$77.50	\$77.50	\$91.40
2001-4000 hours	\$29.80	8	\$65.85	\$80.75	\$80.75	\$95.65
4001-6000 hours	\$31.80	8	\$68.10	\$84.00	\$84.00	\$99.90

Over 6000 hours and thereafter at journeyman rates.

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$20.37
Pension	\$9.00
Vacation and Holiday ^c	\$3.80 (\$4.05 for 2001-4000 hours; \$4.30 for 4001-6000 hours)
Training	\$2.02
Other	\$0.61

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY
THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

**CRAFT: #TEAMSTER (SPECIAL SHIFT)
(APPLIES ONLY TO WORK ON THE CONSTRUCTION SITE)**

Determination:

SC-23-261-2-2025-1

Issue Date:

August 22, 2025

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura Counties.

Wages and total hourly rates (including employer payments):

Classification ^a (Journey person)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^b (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group I	\$42.59	8	\$79.54	\$100.835	\$100.835	\$122.13
Group II	\$42.74	8	\$79.69	\$101.06	\$101.06	\$122.43
Group III	\$42.87	8	\$79.82	\$101.255	\$101.255	\$122.69
Group IV	\$43.06	8	\$80.01	\$101.54	\$101.54	\$123.07
Group V	\$43.09	8	\$80.04	\$101.585	\$101.585	\$123.13
Group VI	\$43.12	8	\$80.07	\$101.63	\$101.63	\$123.19
Group VII	\$43.37	8	\$80.32	\$102.005	\$102.005	\$123.69
Group VIII	\$43.62	8	\$80.57	\$102.38	\$102.38	\$124.19
Group IX	\$43.82	8	\$80.77	\$102.68	\$102.68	\$124.59
Group X	\$44.12	8	\$81.07	\$103.13	\$103.13	\$125.19
Group XI	\$44.62	8	\$81.57	\$103.88	\$103.88	\$126.19

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$20.37
Pension	\$9.00
Vacation and Holiday ^c	\$4.95
Training	\$2.02
Other	\$0.61

Wages and total hourly rates (including employer payments):

Classification ^d (Subjourneyman)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^b (1½x)	Sunday/Holiday Overtime Hourly Rate (2 x)
0-2000 hours	\$27.80	8	\$63.60	\$77.50	\$77.50	\$91.40
2001-4000 hours	\$29.80	8	\$65.85	\$80.75	\$80.75	\$95.65
4001-6000 hours	\$31.80	8	\$68.10	\$84.00	\$84.00	\$99.90

Over 6000 hours and thereafter at journeyman rates.

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$20.37
Pension	\$9.00
Vacation and Holiday ^c	\$3.80 (\$4.05 for 2001-4000 hours; \$4.30 for 4001-6000 hours)
Training	\$2.02
Other	\$0.61

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY
THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #TEAMSTER (SECOND SHIFT)
(APPLIES ONLY TO WORK ON THE CONSTRUCTION SITE)

Determination:

SC-23-261-2-2025-1

Issue Date:

August 22, 2025

Expiration date of determination:

June 30, 2026** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

Localities:

All localities within Imperial, Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura Counties.

Wages and total hourly rates (including employer payments):

Classification ^a (Journey person)	Basic Hourly Rate	Hours ^e	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^b (1½ x)	Sunday/Holiday Overtime Hourly Rate (2 x)
Group I	\$43.59	8	\$80.54	\$102.335	\$102.335	\$124.13
Group II	\$43.74	8	\$80.69	\$102.56	\$102.56	\$124.43
Group III	\$43.87	8	\$80.82	\$102.755	\$102.755	\$124.69
Group IV	\$44.06	8	\$81.01	\$103.04	\$103.04	\$125.07
Group V	\$44.09	8	\$81.04	\$103.085	\$103.085	\$125.13
Group VI	\$44.12	8	\$81.07	\$103.13	\$103.13	\$125.19
Group VII	\$44.37	8	\$81.32	\$103.505	\$103.505	\$125.69
Group VIII	\$44.62	8	\$81.57	\$103.88	\$103.88	\$126.19
Group IX	\$44.82	8	\$81.77	\$104.18	\$104.18	\$126.59
Group X	\$45.12	8	\$82.07	\$104.63	\$104.63	\$127.19
Group XI	\$45.62	8	\$82.57	\$105.38	\$105.38	\$128.19

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$20.37
Pension	\$9.00
Vacation and Holiday ^c	\$4.95
Training	\$2.02
Other	\$0.61

Wages and total hourly rates (including employer payments):

Classification ^d (Subjourneyman)	Basic Hourly Rate	Hours	Total Hourly Rate	Daily Overtime Hourly Rate ^b (1½ x)	Saturday Overtime Hourly Rate ^b (1½x)	Sunday/Holiday Overtime Hourly Rate (2 x)
0-2000 hours	\$27.80	8	\$63.60	\$77.50	\$77.50	\$91.40
2001-4000 hours	\$29.80	8	\$65.85	\$80.75	\$80.75	\$95.65
4001-6000 hours	\$31.80	8	\$68.10	\$84.00	\$84.00	\$99.90

Over 6000 hours and thereafter at journeyman rates.

Employer Payments:

Type of Fund	Amount per Hour
Health and Welfare	\$20.37
Pension	\$9.00
Vacation and Holiday ^c	\$3.80 (\$4.05 for 2001-4000 hours; \$4.30 for 4001-6000 hours)
Training	\$2.02
Other	\$0.61

Recognized holidays:

Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Travel and/or subsistence payment:

In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the [Director's General Prevailing Wage Determinations Website](http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm) (<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>). Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

Classifications:

Group I

Warehouseman and Teamster

Group II

Driver of Vehicle or Combination of Vehicles - 2 axles
Traffic Control Pilot Car, excluding moving heavy
equipment permit load
Truck Mounted Power Broom

Group III

Driver of Vehicle or Combination of Vehicles - 3 axles
Bootman
Cement Mason Distribution Truck
Fuel Truck Driver
Water Truck - 2 axles
Dump Truck of less than 16 yards water level
Erosion Control Driver

Group IV

Driver of Transit Mix Truck-Under 3 yds
Dumpcrete Truck Less than 6½ yards water level
Truck Repairman Helper

Group V

Water Truck 3 or more axles
Warehouseman Clerk
Slurry Truck Driver

Group VI

Driver of Transit Mix Truck - 3 yds or more
Dumpcrete Truck 6½ yds water level and over
Driver of Vehicle or Combination of Vehicles - 4 or
more axles
Driver of Oil Spreader Truck
Dump Truck 16 yds to 25 yds water level

Side Dump Trucks

Flow Boy Dump Trucks

Group VII

A Frame, Swedish Crane or Similar
Forklift Driver
Ross Carrier Driver

Group VIII

Dump Truck of 25 yds to 49 yards water level
Truck Repairman
Water Pull Single Engine
Welder

Group IX

Truck Repairman Welder
Low Bed Driver, 9 axles or over

Group X

Working Truck Driver
Truck Greaser and Tireman - \$0.50 additional for
Tireman
Pipeline and Utility Working Truck Driver, including
Winch Truck and Plastic Fusion, limited to Pipeline
and Utility Work
Dump Truck and Articulating - 50 yards or more water
level
Water Pull Single Engine with attachment

Group XI

Water Pull Twin Engine
Water Pull Twin Engine with attachments
Winch Truck Driver - \$0.25 additional when operating
a Winch or similar special attachment

[#] Indicates an apprenticeable craft. The current apprentice wage rates are available on the [Prevailing Wage
Apprentice Determinations Website](http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp) (<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>).

^a For classifications within each group, see Page 7.

^b Rate applies to the first 4 daily overtime hours on weekdays and the first 12 hours on Saturday. All other overtime is paid at the Sunday/Holiday double-time rate.

^c Includes an amount for Supplemental Dues.

^d Subjourneymen may be employed at a ratio of one subjourneyman for every five journeymen.

^e The third shift shall work 6.5 hours, exclusive of meal period, for which 8-hours straight time shall be paid at the non-shift rate, Monday through Friday.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE
PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1 FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING
PROJECTS

LOCALITY: MONO COUNTY

DETERMINATION: MON-2026-1

CRAFT	CLASSIFICATION	CRAFT FOOTNOTE	ISSUE DATE	EXPIRATION DATE	BASIC HOURLY RATE	BASIC HOURLY RATE FOOTNOTE	HEALTH AND WELFARE	HEALTH AND WELFARE FOOTNOTE	PENSION	PENSION FOOTNOTE	VACATION/ HOLIDAY	VACATION/ HOLIDAY FOOTNOTE	TRAINING	TRAINING FOOTNOTE	OTHER PAYMENTS	OTHER PAYMENTS FOOTNOTE	HOURS	HOURS FOOTNOTE	STRAIGHT-TIME TOTAL HOURLY RATE	DAILY OVERTIME HOURLY RATE	DAILY OVERTIME HOURLY RATE FOOTNOTE	SATURDAY OVERTIME HOURLY RATE	SATURDAY OVERTIME HOURLY RATE FOOTNOTE	SUNDA AND HOLIDAY OVERTIME HOURLY RATE
#BRICKLAYER:	BRICKLAYER, CEMENT BLOCKLAYER, POINTER, CAULKER, CLEANER		02/22/2026	04/30/2026**	\$52.580	A	\$9.500		\$9.980		\$0.000		\$1.750	B	\$1.050		8.0	C	\$74.860	\$98.820	D	\$98.820	D	\$122.780
#BRICKLAYER:	STONEMASON, MARBLE MASON		02/22/2026	04/30/2026**	\$52.580	A	\$9.500		\$9.980		\$0.000		\$1.750	B	\$0.650		8.0	C	\$74.460	\$98.420	D	\$98.420	D	\$122.380
#BRICKLAYER:	MASON FINISHER		02/22/2026	04/30/2026**	\$47.320	A	\$9.250		\$9.830		\$0.000		\$1.180	B	\$0.650		8.0	C	\$68.230	\$89.790	D	\$89.790	D	\$111.350
#BRICK TENDER		E	08/22/2025	06/30/2026*	\$43.430		\$9.550		\$9.820	F	\$4.400	G	\$0.800		\$0.450		8.0	C	\$68.450	\$90.170		\$90.170		\$111.880
#BRICK TENDER	FORKLIFT OPERATOR		08/22/2025	06/30/2026*	\$43.880		\$9.550		\$9.820	F	\$4.400	G	\$0.800		\$0.450		8.0	C	\$68.900	\$90.840		\$90.840		\$112.780
#CARPET, LINOLEUM,	RESILIENT TILE LAYER		02/22/2026	04/30/2026*	\$46.850	H	\$10.380		\$6.550		\$2.680		\$0.730		\$0.320		8.0		\$67.510	\$90.930		\$90.930	I	\$114.360
CARPET, LINOLEUM,	MATERIAL HANDLER	J	02/22/2026	04/30/2026*	\$18.740	H	\$10.380		\$2.340		\$1.180		\$0.730		\$0.320		8.0		\$33.690	\$43.060		\$43.060	K	\$52.430
#DRYWALL FINISHER			08/22/2025	08/31/2026*	\$47.200	L	\$9.200		\$12.080		\$6.070		\$0.920		\$1.220		8.0		\$76.690	\$100.290		\$100.290	M	\$123.890
#ELECTRICIAN:	SOUND INSTALLER		08/22/2025	11/30/2025*	\$46.430		\$11.360		\$7.500	N	\$0.000		\$0.650		\$0.300	Q	8.0		\$67.630	\$91.540	P	\$91.540	P	\$115.460
#ELECTRICIAN:	INSIDE WIREMAN (ZONE B)	Q	08/22/2025	05/31/2026**	\$73.850	L	\$11.460		\$16.640	N	\$0.000		\$1.080		\$0.370	R	8.0		\$106.000	\$144.210	S	\$144.210	S	\$182.430
#ELECTRICIAN:	CABLE SPLICER (ZONE B)	Q	08/22/2025	05/31/2026**	\$77.540	L	\$11.460		\$16.640	N	\$0.000		\$1.080		\$0.390	R	8.0		\$109.820	\$149.940	S	\$149.940	S	\$190.070
#ELECTRICIAN:	TUNNEL WIREMAN (ZONE B)	Q	08/22/2025	05/31/2026**	\$81.240	L	\$11.460		\$16.640	N	\$0.000		\$1.080		\$0.410	R	8.0		\$113.650	\$155.690	S	\$155.690	S	\$197.730
#FIELD SURVEYOR:	CHIEF OF PARTY (018.167-010)	I	02/22/2026	06/30/2026**	\$67.910		\$15.200		\$16.150		\$4.670	G	\$1.300		\$0.150		8.0		\$105.380	\$139.340	P	\$139.340	P	\$173.290
#FIELD SURVEYOR:	INSTRUMENTMAN (018.167-034)	I	02/22/2026	06/30/2026**	\$60.260		\$15.200		\$16.150		\$4.500	G	\$1.300		\$0.150		8.0		\$97.560	\$127.690	P	\$127.690	P	\$157.820
#FIELD SURVEYOR:	CHAINMAN/RODMAN (869.567-010)	I	02/22/2026	06/30/2026**	\$59.680		\$15.200		\$16.150		\$4.450	G	\$1.300		\$0.150		8.0		\$96.930	\$126.770	P	\$126.770	P	\$156.610
GLAZIER			02/22/2026	03/31/2026*	\$16.900	X	\$0.000		\$0.000		\$0.550		\$0.000		\$0.000		8.0		\$17.450	\$25.900		\$25.900		\$25.900
#MARBLE FINISHER			08/22/2025	05/31/2026**	\$45.560	U	\$9.250		\$6.020		\$0.000		\$1.380		\$0.550		8.0		\$62.760	\$85.540	V	\$85.540	W	\$108.320
#PAINTER:	PAINTER, LEAD ABATEMENT	Y	08/22/2025	06/30/2026**	\$38.980	L	\$9.200		\$6.040		\$2.910		\$0.750		\$1.210		8.0		\$59.090	\$78.580	Z	\$78.580	Z	\$98.070
#PAINTER:	INDUSTRIAL PAINTER	Y	08/22/2025	06/30/2026**	\$47.320	L	\$9.200		\$6.040		\$3.350		\$0.850		\$1.210		8.0		\$67.970	\$91.630	Z	\$91.630	Z	\$115.290
PAINTER:	GRAFFITI REMOVAL WORKER JOURNEYMAN (APPLIES ONLY TO PAINT-OVER METHOD)	AA	02/22/2026	01/31/2027**	\$30.450	U	\$8.000		\$1.120		\$0.750		\$0.100		\$0.250		8.0		\$40.670	\$55.900		\$55.900	AB	\$71.120
PAINTER:	GRAFFITI REMOVAL WORKER 1 (APPLIES ONLY TO PAINT-OVER METHOD)	AD	02/22/2026	01/31/2027**	\$20.950	U	\$8.000		\$1.120		\$0.750		\$0.100		\$0.250		8.0		\$31.170	\$41.650		\$41.650	AB	\$52.120
PAINTER:	GRAFFITI REMOVAL WORKER 2 (APPLIES ONLY TO PAINT-OVER METHOD)	AE	02/22/2026	01/31/2027**	\$21.820	U	\$8.000		\$1.120		\$0.750		\$0.100		\$0.250		8.0		\$32.040	\$42.950		\$42.950	AB	\$53.860
#PLASTERER			08/22/2025	07/31/2026*	\$46.180		\$9.630		\$11.310		\$8.400	AF	\$1.490		\$1.190		8.0	AG	\$78.200	\$101.290	Z	\$101.290	AH	\$124.380
#PLASTER TENDER		AI	02/22/2026	08/04/2026*	\$48.720		\$9.550		\$11.970		\$5.300	AJ	\$1.200		\$0.960		8.0		\$77.700	\$102.060	AK	\$102.060	AL	\$126.420
PLASTER TENDER	PLASTER CLEAN-UP LABORER		02/22/2026	08/04/2026*	\$46.170		\$9.550		\$11.970		\$5.300	AJ	\$1.200		\$0.960		8.0		\$75.150	\$98.240	AK	\$98.240	AL	\$121.320

CRAFT	CLASSIFICATION	CRAFT FOOTNOTE	ISSUE DATE	EXPIRATION DATE	BASIC HOURLY RATE	BASIC HOURLY RATE FOOTNOTE	HEALTH AND WELFARE	HEALTH AND WELFARE FOOTNOTE	PENSION	PENSION FOOTNOTE	VACATION/ HOLIDAY	VACATION/ HOLIDAY FOOTNOTE	TRAINING	TRAINING FOOTNOTE	OTHER PAYMENTS	OTHER PAYMENTS FOOTNOTE	HOURS	HOURS FOOTNOTE	STRAIGHT-TIME TOTAL HOURLY RATE	DAILY OVERTIME HOURLY RATE	DAILY OVERTIME HOURLY RATE FOOTNOTE	SATURDAY OVERTIME HOURLY RATE	SATURDAY OVERTIME HOURLY RATE FOOTNOTE	SUNDA AND HOLIDAY OVERTIME HOURLY RATE
#PLUMBER:	PLUMBER, INDUSTRIAL AND GENERAL PIPEFITTER		02/22/2026	08/31/2026**	\$61.730	AM	\$9.360		\$14.350	AN	\$0.000	AO	\$3.100		\$1.650	AP	8.0		\$90.190	\$120.080	D	\$120.080	D	\$148.250
#PLUMBER:	REFRIGERATION FITTER SERVICE/REPAIR		02/22/2026	08/31/2026**	\$61.730	AM	\$9.360		\$14.350	AN	\$0.000	AO	\$3.100		\$1.650	AP	8.0		\$90.190	\$120.080		\$120.080	AQ	\$148.250
#PLUMBER:	LANDSCAPE/IRRIGATION FITTER		02/22/2026	08/31/2026**	\$44.750	U	\$9.360		\$14.350	AN	\$0.000	AO	\$2.490		\$1.450	AP	8.0		\$72.400	\$94.780		\$94.780	AS	\$115.700
PLUMBER:	LANDSCAPE/IRRIGATION TRADESMAN	AT	02/22/2026	08/31/2026**	\$21.460	U	\$3.000		\$1.160	AN	\$0.000		\$0.100		\$1.250	AP	8.0		\$26.970	\$37.700		\$37.700	AS	\$48.430
#PLUMBER:	FIRE SPRINKLER FITTER (PROTECTION AND CONTROL SYSTEMS, OVERHEAD AND UNDERGROUND)		02/22/2026	03/31/2026**	\$50.790		\$13.600		\$15.610	AU	\$0.000		\$0.590		\$0.300		8.0		\$80.890	\$106.280		\$106.280		\$131.680
ROOFER			02/22/2026	03/31/2026*	\$16.900		\$1.840		\$1.200		\$0.500		\$0.300		\$0.000		8.0	AS	\$20.740	\$29.190		\$29.190		\$37.640
ROOFER	PITCH WORK		02/22/2026	03/31/2026*	\$18.300		\$1.840		\$1.200		\$0.500		\$0.300		\$0.000		8.0	AS	\$22.140	\$31.290		\$31.290		\$40.440
#SHEET METAL WORKER			08/22/2025	06/30/2026**	\$62.410	L	\$11.770		\$18.010	AV	\$0.000		\$0.820		\$0.720		8.0		\$93.730	\$124.930	AW	\$124.930	AW	\$156.140
#TERRAZZO FINISHER			08/22/2025	08/31/2026*	\$45.130	H	\$9.250		\$4.710		\$0.000	AX	\$1.110		\$0.330		8.0	AS	\$60.530	\$83.100	V	\$83.100	AY	\$105.660
#TERRAZZO WORKER			08/22/2025	08/31/2026*	\$52.670	H	\$9.250		\$4.860		\$0.000	AX	\$1.340		\$0.390		8.0	AS	\$68.510	\$94.850	V	\$94.850	AY	\$121.180
#TILE FINISHER			08/22/2025	05/31/2026**	\$40.130	U	\$9.250		\$4.500		\$0.000		\$1.310		\$0.510		8.0		\$55.700	\$75.760	V	\$75.760	W	\$95.830
#TILE LAYER			08/22/2025	05/31/2026**	\$54.360	U	\$9.250		\$9.850		\$0.000		\$1.510		\$0.620		8.0		\$75.590	\$102.770	V	\$102.770	W	\$129.950

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FOOTNOTES

- * EFFECTIVE UNTIL SUPERSEDED BY A NEW DETERMINATION ISSUED BY THE DIRECTOR OF INDUSTRIAL RELATIONS. CONTACT THE OFFICE OF THE DIRECTOR - RESEARCH UNIT AT (415) 703-4774 FOR THE NEW RATES AFTER TEN DAYS AFTER THE EXPIRATION DATE IF NO SUBSEQUENT DETERMINATION IS ISSUED.
- ** THE RATE TO BE PAID FOR WORK PERFORMED AFTER THIS DATE HAS BEEN DETERMINED. IF WORK WILL EXTEND PAST THIS DATE, THE NEW RATE MUST BE PAID AND SHOULD BE INCORPORATED IN CONTRACTS ENTERED INTO NOW. CONTACT THE OFFICE OF THE DIRECTOR RESEARCH UNIT FOR SPECIFIC RATES AT (415) 703-4774.
- # INDICATES AN APPRENTICEABLE CRAFT. THE CURRENT APPRENTICE WAGE RATES ARE AVAILABLE ON THE INTERNET @ HTTP://WWW.DIR.CA.GOV/OPRL/PWAPPWAGE/PWAPPWAGESTART.ASP.
- & THE BASIC HOURLY RATE AND EMPLOYER PAYMENTS ARE NOT TAKEN FROM A COLLECTIVE BARGAINING AGREEMENT FOR THIS CRAFT OR CLASSIFICATION.
- A INCLUDES AMOUNTS FOR DUES CHECK OFF, CONTRACT COMPLIANCE AND VACATION WHICH ARE NOT FACTORED INTO OVERTIME RATES.
- B INCLUDES AN AMOUNT FOR IMI TRAINING FUND.
- C SATURDAYS IN THE SAME WORK WEEK MAY BE WORKED AT STRAIGHT-TIME IF JOB IS SHUT DOWN DURING THE NORMAL WORKWEEK DUE TO INCLEMENT WEATHER, OR REASONS BEYOND THE CONTROL OF THE EMPLOYER.
- D RATE APPLIES TO THE FIRST 2 DAILY OVERTIME HOURS AND THE FIRST 10 HOURS ON SATURDAY; ALL OTHER TIME IS PAID AT THE SUNDAY AND HOLIDAY OVERTIME HOURLY RATE.
- E THE RATIO OF BRICK TENDERS TO BRICKLAYERS SHALL BE AS FOLLOWS: ONE (1) BRICK TENDER TO NO MORE THAN THREE (3) BRICKLAYERS DURING THE INSTALLATION OF BLOCK ON A TYPICAL MASONRY PROJECT.
- F INCLUDES AN AMOUNT PER HOUR WORKED FOR ANNUITY TRUST FUND.
- G INCLUDES AN AMOUNT PER HOUR WORKED FOR SUPPLEMENTAL DUES.
- H INCLUDES AMOUNT WITHHELD FOR DUES CHECK OFF.
- I RATE APPLIES TO THE FIRST 12 HOURS WORKED ON SATURDAY, ALL OTHER TIME IS PAID AT DOUBLE TIME. SATURDAY MAY BE WORKED AT THE STRAIGHT-TIME HOURLY RATE FOR THE FIRST 8 HOURS IF INCLEMENT WEATHER FORCES A SYNTHETIC/ARTIFICIAL TURF PROJECT TO SHUT DOWN DURING THE REGULAR WORK WEEK (MONDAY THOUGH FRIDAY).
- J A MATERIAL HANDLER MAY BE UTILIZED IN RATIO OF ONE (1) MATERIAL HANDLER WITH ANY FIVE (5) JOURNEYMEN ON ANY GIVEN PROJECT.
- K RATE APPLIES TO THE FIRST 12 HOURS ON SATURDAY, ALL OTHER TIME IS PAID AT DOUBLE TIME.
- L INCLUDES AMOUNT WITHHELD FOR WORKING DUES.
- M RATE APPLIES TO FIRST 8 HOURS ONLY. DOUBLE TIME THEREAFTER. SATURDAYS IN THE SAME WORK WEEK MAY BE WORKED AT STRAIGHT-TIME IF JOB IS SHUT DOWN DURING THE NORMAL WORK WEEK DUE TO INCLEMENT WEATHER.
- N IN ADDITION, AN AMOUNT EQUAL TO 3% OF THE BASIC HOURLY RATE IS ADDED TO THE TOTAL HOURLY RATE AND OVERTIME HOURLY RATES FOR THE NATIONAL EMPLOYEES BENEFIT BOARD.
- INCLUDES AN AMOUNT FOR THE NATIONAL LABOR-MANAGEMENT COOPERATION FUND AND THE ADMINISTRATIVE MAINTENANCE FUND.

- O P RATE APPLIES TO THE FIRST 4 DAILY OVERTIME HOURS AND THE FIRST 12 HOURS WORKED ON SATURDAY; ALL OTHER TIME IS PAID AT THE SUNDAY AND HOLIDAY OVERTIME HOURLY RATE.
- Q ZONE B INCLUDES ALL OF INYO AND MONO COUNTY AND THE PORTION OF SAN BERNARDINO COUNTY OVER 80 MILES FROM SAN BERNARDINO CITY HALL AT 290 NORTH D STREET IN SAN BERNARDINO, CA 93401.
- R IN ADDITION TO THE AMOUNT SHOWN, WHICH IS FACTORED AT THE APPLICABLE OVERTIME MULTIPLIER FOR EACH OVERTIME HOUR, \$0.38 IS ADDED TO THE TOTAL HOURLY RATE AND OVERTIME HOURLY RATES FOR THE LABOR MANAGEMENTCOOPERATION COMMITTEE FUND. AMOUNT FOR LABOR MANAGEMENTCOOPERATION COMMITTEE FUND IS NOT FACTORED AT THE APPLICABLE OVERTIME MULTIPLIER
- S RATE APPLIES TO THE FIRST 2 DAILY OVERTIME HOURS AND THE FIRST 8 HOURS ON SATURDAY ONLY; ALL OTHER TIME IS PAID AT THE SUNDAY AND HOLIDAY OVERTIME HOURLY RATE. ALL OVERTIME WORKED DAILY OR ON SATURDAYS, FOR SERVICE AND REPAIR WORK OTHER THAN NEW WORK, MAY BE PAID AT THE RATE OF TIME AND ONE-HALF.
- T DICTIONARY OF OCCUPATIONAL TITLES, FOURTH EDITION, 1977, U.S. DEPARTMENT OF LABOR.
- U INCLUDES AMOUNT WITHHELD FOR ADMINISTRATIVE DUES.
- V RATE APPLIES TO FIRST TWO DAILY OVERTIME HOURS WORKED; ALL OTHER OVERTIME IS PAID AT THE HOLIDAY OVERTIME HOURLY RATE.
- W SATURDAY OVERTIME HOURLY RATE SHALL NOT BE OWED FOR WORK PERFORMED ON A SATURDAY UNLESS AND UNTIL THE EMPLOYEE HAS WORKED 8 HOURS ON THAT DAY OR 40 HOURS OVER THE COURSE OF THE WORK WEEK OF WHICH THE SATURDAY IS A PART, WHICHEVER COMES FIRST. RATE APPLIES TO THE FIRST 8 HOURS WORKED ON A SIXTH OR SEVENTH CONSECUTIVE DAY DURING ANY ONE CALENDAR WEEK UP TO 50 HOURS IN ANY ONE CALENDAR WEEK. ALL HOURS IN EXCESS OF 10 HOURS DAILY OR 50 HOURS WEEKLY ARE PAID AT THE HOLIDAY RATE. SATURDAYS IN THE SAME WORK WEEK MAY BE WORKED AT STRAIGHT-TIME IF JOB IS SHUT DOWN DURING THE NORMAL WORKWEEK DUE TO INCLEMENT WEATHER.
- X RATE APPLIES TO WORK ON HOLIDAYS ONLY; SUNDAYS ARE PAID AT THE SATURDAY OVERTIME HOURLY RATE.
- Y AN ADDITIONAL \$3.00 PER HOUR WILL BE ADDED TO THE BASIC HOURLY RATE WHEN PERFORMING PAPERHANGING WORK.
- Z DOUBLE TIME SHALL BE PAID FOR ALL HOURS WORKED OVER 12 HOURS IN ANY ONE DAY.
- AA RATE APPLIES AFTER 36 MONTHS OF EXPERIENCE
- AB RATE APPLIES TO ALL TIME WORKED IN EXCESS OF 8 HOURS IN ONE WORK DAY OR 40 HOURS IN ONE WORK WEEK MONDAY THROUGH SUNDAY; SATURDAY AND SUNDAY MAY BE WORKED AT THE STRAIGHT TIME RATE, PROVIDED THAT THE HOURS DO NOT EXCEED 8 HOURS IN ONE WORK DAY OR 40 HOURS IN ONE WORK WEEK.
- AC RATE APPLIES TO ALL HOURS IN EXCESS OF 12 HOURS IN ONE WORK DAY, MONDAY THROUGH SATURDAY, AND TO ALL HOURS WORKED IN EXCESS OF 8 HOURS ON SUNDAYS. RATE ALSO APPLIES TO WORK ON HOLIDAYS. FOR WORK ON SUNDAY, SEE SATURDAY OVERTIME HOURLY RATE AND FOOTNOTE.
- AD RATE APPLIES TO FIRST 12 MONTHS OF EXPERIENCE
- AE RATE APPLIES AFTER 12 MONTHS THROUGH 36 MONTHS EXPERIENCE
- AF INCLUDES AN AMOUNT PER HOUR WORKED OR PAID FOR DUES CHECK OFF
- AG SATURDAY IN THE SAME WORKWEEK MAY BE WORKED AT THE STRAIGHT-TIME HOURLY RATE IF IT IS NOT POSSIBLE TO COMPLETE FORTY HOURS OF WORK MONDAY THROUGH FRIDAY WHEN THE JOB IS SHUT DOWN DUE TO INCLEMENT WEATHER OR SIMILAR ACT OF GOD, OR BEYOND THE CONTRACTOR'S CONTROL.
- AH RATE APPLIES TO THE FIRST 8 HOURS WORKED; ALL OTHER TIME IS PAID AT THE SUNDAY AND HOLIDAY OVERTIME HOURLY RATE.
- AI THE RATIO OF PLASTER TENDERS TO PLASTERERS SHALL BE AS FOLLOWS: THERE SHALL BE A PLASTER TENDER ON THE JOBSITE WHENEVER THERE IS A PLASTERER PERFORMING WORK ON THE JOBSITE, EXCEPT ON SMALL PATCH WORK WHERE ONLY ONE PLASTERER IS PERFORMING WORK. FOR INSIDE BROWN COATINGS THERE SHALL BE 2 PLASTER TENDERS FOR UP TO EVERY 3 PLASTERERS. FOR INSIDE FINISH COATINGS THERE SHALL BE 1 PLASTER TENDER FOR UP TO EVERY 3 PLASTERERS. ON OUTSIDE FINISH AND BROWN COATINGS AND FOR ALL OTHER WORK, THERE SHALL BE 1 PLASTER TENDER FOR UP TO EVERY 2 PLASTERERS.
- AJ INCLUDES AN AMOUNT PER HOUR WORKED OR PAID FOR SUPPLEMENTAL DUES.
- AK ALL WORK PERFORMED AFTER TWELVE (12) HOURS IN A DAY SHALL BE PAID AT THE SUNDAY/HOLIDAY RATE.
- AL RATE APPLIES TO THE FIRST EIGHT HOURS ON SATURDAY. ALL OTHER TIME IS PAID AT THE SUNDAY AND HOLIDAY OVERTIME RATE. SATURDAY WORK MAY BE PAID AT THE STRAIGHT TIME RATE IF THE JOB IS SHUT DOWN DURING THE NORMAL WORK WEEK DUE TO INCLEMENT WEATHER.
- AM INCLUDES AN AMOUNT WITHHELD FOR ADMINISTRATIVE DUES WHICH IS NOT FACTORED INTO OVERTIME AND AN AMOUNT FOR VACATION WHICH IS FACTORED AT 1.5 TIMES FOR ALL OVERTIME.
- AN INCLUDES AMOUNT FOR NATIONAL PENSION AND RETIREE'S X-MAS FUND.
- AO AMOUNT INCLUDED IN BASIC HOURLY RATE AND FACTORED AT 1.5 TIMES FOR ALL OVERTIME.
- AP INCLUDES AN AMOUNT FOR THE P.I.P.E. LABOR MANAGEMENT COOPERATION COMMITTEE AND THE CONTRACTOR EDUCATION & DEVELOPMENT FUND.
- AQ SATURDAY MAY BE WORKED AT STRAIGHT-TIME RATE, PROVIDED THAT THE HOURS DO NOT EXCEED 8 HOURS PER DAY OR 40 HOURS PER WEEK.
- AR DOUBLE TIME SHALL BE PAID FOR NEW YEAR'S DAY, EASTER SUNDAY, LABOR DAY, THANKSGIVING DAY, AND CHRISTMAS.
- AS SATURDAYS IN THE SAME WORK WEEK MAY BE WORKED AT STRAIGHT-TIME IF JOB IS SHUT DOWN DURING THE NORMAL WORKWEEK DUE TO INCLEMENT WEATHER.
- AT TRADESMEN SHALL ONLY BE USED IF THE FIRST WORKER ON THE JOB IS A LANDSCAPE/IRRIGATION FITTER, SECOND WORKER MUST BE A LANDSCAPE/IRRIGATION FITTER OR APPRENTICE LANDSCAPE/IRRIGATION FITTER. THE 3RD AND 4TH MAY BE A TRADESMAN. THE 5TH MUST BE A LANDSCAPE/IRRIGATION FITTER AND THEREAFTER TRADESMEN WILL BE REFERRED ON A 50-50 BASIS, TO JOURNEYMAN OR APPRENTICE.
- AU INCLUDES AN AMOUNT FOR SUPPLEMENTAL PENSION FUND.
- AV PURSUANT TO LABOR CODE SECTIONS 1773.1 AND 1773.8, THE AMOUNT PAID FOR THIS EMPLOYER PAYMENT MAY VARY RESULTING IN A LOWER TAXABLE BASIC HOURLY WAGE RATE, BUT THE TOTAL HOURLY RATES FOR STRAIGHT TIME AND OVERTIME MAY NOT BE LESS THAN THE GENERAL PREVAILING RATE OF PER DIEM WAGES.
- AW RATE APPLIES FOR THE FIRST 4 OVERTIME HOURS MONDAY THROUGH FRIDAY AND THE FIRST 12 HOURS WORKED ON SATURDAY. ALL OTHER TIME IS PAID AT THE SUNDAY/HOLIDAY RATE. SATURDAYS IN THE SAME WORKWEEK MAY BE WORKED AT STRAIGHT-TIME IF JOB IS SHUT DOWN DURING THE NORMAL WORKWEEK DUE TO INCLEMENT WEATHER.
- AX INCLUDED IN STRAIGHT-TIME HOURLY RATE.
- AY RATE APPLIES TO THE FIRST 8 HOURS WORKED ON A SIXTH OR SEVENTH CONSECUTIVE DAY DURING ANY ONE CALENDAR WEEK UP TO 50 HOURS IN ANY ONE CALENDAR WEEK. ALL OTHER TIME IS PAID AT THE HOLIDAY RATE.

RECOGNIZED HOLIDAYS: HOLIDAYS UPON WHICH THE GENERAL PREVAILING HOURLY WAGE RATE FOR HOLIDAY WORK SHALL BE PAID, SHALL BE ALL HOLIDAYS IN THE COLLECTIVE BARGAINING AGREEMENT, APPLICABLE TO THE PARTICULAR CRAFT, CLASSIFICATION, OR TYPE OF WORKER EMPLOYED ON THE PROJECT, WHICH IS ON FILE WITH THE DIRECTOR OF INDUSTRIAL RELATIONS. IF THE PREVAILING RATE IS NOT BASED ON A COLLECTIVELY BARGAINED RATE, THE HOLIDAYS UPON WHICH THE PREVAILING RATE SHALL BE PAID SHALL BE AS PROVIDED IN SECTION 6700 OF THE GOVERNMENT CODE. YOU MAY OBTAIN THE HOLIDAY PROVISIONS FOR THE CURRENT DETERMINATIONS ON THE INTERNET AT [HTTP://WWW.DIR.CA.GOV/OPRL/DPreWageDetermination.htm](http://WWW.DIR.CA.GOV/OPRL/DPreWageDetermination.htm). HOLIDAY PROVISIONS FOR THE CURRENT OR SUPERSEDED DETERMINATIONS MAY BE OBTAINED BY CONTACTING THE OFFICE OF THE DIRECTOR - RESEARCH UNIT AT (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE: IN ACCORDANCE WITH LABOR CODE SECTIONS 1773.1 AND 1773.9, CONTRACTORS SHALL MAKE TRAVEL AND/OR SUBSISTENCE PAYMENTS TO EACH WORKER TO EXECUTE THE WORK. YOU MAY OBTAIN THE TRAVEL AND/OR SUBSISTENCE PROVISIONS FOR THE CURRENT DETERMINATIONS ON THE INTERNET AT [HTTP://WWW.DIR.CA.GOV/OPRL/DPreWageDetermination.htm](http://WWW.DIR.CA.GOV/OPRL/DPreWageDetermination.htm). TRAVEL AND/OR SUBSISTENCE REQUIREMENTS FOR CURRENT OR SUPERSEDED DETERMINATIONS MAY BE OBTAINED BY CONTACTING THE OFFICE OF THE DIRECTOR - RESEARCH UNIT AT (415) 703-4774.

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**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Special Provisions

FEDERAL PROVISIONS

PART A: GENERAL CONTRACT PROVISIONS

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SPECIAL PROVISIONS

PART I - FAA 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	<p>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.</p> <p>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.</p>
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.
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.

Paragraph Number	Term	Definition
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.
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.

Paragraph Number	Term	Definition
10-30	Force Account	<p>a. Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis.</p> <p>b. Owner Force Account - Work performed for the project by the Owner's employees.</p>
10-31	Intention of Terms	<p>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.</p> <p>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.</p>
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.
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 The Town of Mammoth Lakes

Paragraph Number	Term	Definition
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.
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

Paragraph Number	Term	Definition
		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.
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

Paragraph Number	Term	Definition
		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.
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). The advertisement can be found in the Contractual Provisions as the Notice Inviting Bids.

20-02 Qualification of bidders. Each bidder shall submit evidence of competency 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.

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.

A prebid conference is required on this project to discuss as a minimum, the following items: material requirements; submittals; Quality Control/Quality Assurance requirements; the construction safety and phasing plan including airport access and staging areas; and unique airfield paving construction requirements. This pre-bid meeting will be held on **Wednesday, June 10, 2026, at 1:00 P.M.** in the *Airport Manager's Office at the Mammoth Yosemite Airport, 1300 Airport Road, Mammoth Lakes, CA, 93546*. Contractors may attend in person or may participate virtually. **Information will be posted on the Online Bid Portal page.** For those who can attend in person, a site walk will be conducted after the pre-bid meeting. For those who can attend in person, a site walk will be conducted after the pre-bid meeting. For those attending virtually, a separate site visit by appointment only may be arranged by contacting Soibian Spring sspring@townofmammothlakes.ca.gov.

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.

Boring logs and other records of subsurface investigations and tests are available for inspection of bidders. It is understood and agreed that such subsurface information, whether included in the plans, specifications, or otherwise made available to the bidder, was obtained and is intended for the Owner's design and estimating purposes only. Such information has been made available for the convenience of all bidders. It is further understood and agreed that each bidder is solely responsible for all assumptions, deductions, or conclusions which the bidder may make or obtain from their own examination of the boring logs and other records of subsurface investigations and tests that are furnished by the Owner.

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. Bids will be received through the Town's eProcurement Portal at:

[Online Bid Portal](https://www.townofmammothlakes.ca.gov/1016/Bids)

<https://www.townofmammothlakes.ca.gov/1016/Bids>

All blank spaces for bid prices must be filled in. There is a bid form that is electronic on the project website under Project Documents Section 4, Bid Form. The electronic bid form under Project Documents Section 4, Bid Form must be used in addition to Pages A1 thru A29 in the Proposal and Contract Document.

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 determined to be unresponsive and will not be considered.

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 by email sspring@townofmammothlakes.ca.gov 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 calendar 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

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 95 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. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

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

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. The Special Provisions are listed below in the order of preference. These documents shall govern in the following order:

1 st	Change Order or Supplemental Agreement
2 nd	Contract/Agreement
3 rd	Addenda to the Plans and Specifications
4 th	Bid Proposal
5 th	Technical Provisions
6 th	Special Conditions
7 th	Construction Plans
8 th	FAA General Contract Provisions
9 th	FAA General Construction Items
10 th	State Standard Plans and Specifications
11 th	FAA Specifications and Advisory Circulars

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): .CSV file.

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.

Accuracy of surveys shall be to the thousandths of a foot.

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

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.

The Contractor shall employ a Quality Control (QC) testing organization to perform all Contractor required QC tests in accordance with Item C-100 Contractor Quality Control Program (CQCP).

Contractor shall furnish all QC test results to the RPR in electronic (.pdf) format. Details of the acceptable format to be used are included in Appendix B, Construction Management Plan.

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

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 A01-02 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.

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.

Utility Service or Facility	Person to Contact (Name, Title, Address & Phone)	Owner's Emergency Contact (Phone)
Southern California Edison	Chateau Road, Mammoth Lakes (800) 655-4555	(800) 655-4555
Frontier Communications		
Amerigas	66 S. Industrial Circle, Suite A6 Mammoth Lakes, CA 93546	(760) 934-2213
Mammoth Yosemite Airport Water System	1300 Airport Road, Mammoth Lakes, CA 93546 (760) 965-3620	(760) 965-3620

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.

70-15.1 FAA facilities and cable runs. The Contractor is hereby advised that the construction limits of the project include existing facilities and buried cable runs that are owned, operated and maintained by the FAA. The Contractor, during the execution of the project work, shall comply with the following:

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.

b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.

c. If execution of the project work requires a facility outage, the Contractor shall contact the FAA Point-of-Contact a minimum of 72 hours prior to the time of the required outage.

d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.

e. If the project work requires the cutting or splicing of FAA owned cables, the FAA Point-of-Contact shall be contacted a minimum of 72 hours prior to the time the cable work commences. The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

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. Contractor shall procure and maintain for the duration of the contract the following minimum insurance coverage and limits against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work covered by this agreement by the Contractor, his agents, representatives, employees or subcontractors:

<u>COVERAGE PER OCCURRENCE</u>	<u>ISO FORM</u>
Commercial General	CG 00 01 11 85 or 88 Rev.
Liability (Primary) - \$1,000,000	
Umbrella Liability	GL 00 01 11 85 or 88 Rev.
(Over Primary, if required) - \$1,000,000	
Business Auto - \$1,000,000	CA 00 01 06 92
Workers' Compensation - Statutory	
Employers' Liability - \$1,000,000	

Contractor shall provide endorsements or other proof of coverage for contractual liability.

Combined single limit per occurrence shall include coverage for bodily injury, personal injury, and property damage for each accident and a **\$2 million general aggregate**.

Liability coverage shall not be limited to the vicarious liability or supervising role of any additional insured. Coverage shall contain no contractors' limitation endorsements and there shall be no endorsement or modification limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, or employment related practices.

Any umbrella liability coverage shall apply to bodily injury/property damage, personal injury/advertising injury, at a minimum, and shall include a "drop down" provision providing primary coverage above a maximum \$25,000 self-insured retention for liability not covered by primary policies not covered by the

umbrella policy. Coverage shall be following form to any other underlying coverage. Coverage shall be on a "pay on behalf" basis, with defense costs payable in addition to policy limits. There shall be no cross policy exclusion and no contractor limitation endorsement. The policy shall have starting and ending dates concurrent with the underlying coverage.

Liability policies shall contain, or be endorsed to contain the following provisions:

GENERAL LIABILITY AND AUTOMOBILE LIABILITY:

The TOWN, and their consultants, and each of their directors, officers, officials, employees, and volunteers shall be covered as additional insureds using ISO form CG 20 10 11 85 as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope or protection afforded to the TOWN, and their consultants, and each of their directors, officers, officials, employees, or volunteers.

The Contractor's insurance coverage shall be primary insurance with respect to the TOWN, and their consultants, and each of their directors, officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the TOWN, and their consultants, and each of their directors, officers, officials, employees, and volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the TOWN, and their consultants, and each of their directors, officers, officials, employees, and volunteers.

The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY:

Each insurance policy required by this subsection shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after fifteen (15) days written notice by certified mail, return receipt requested, has been given to:

Director of Public Works
TOWN OF MAMMOTH LAKES
POST OFFICE BOX 1609
Mammoth Lakes, CA 93546

All liability insurance shall be on an occurrence basis. Insurance on a claims made basis will be rejected. Any deductibles or self-insured retentions shall be declared to and approved by TOWN. The insurer shall provide an endorsement to TOWN eliminating such deductibles or self-insured retentions as respects the TOWN, and their consultants, and each of their directors, officers, employees, and volunteers.

Contractor shall furnish to TOWN certificates of insurance and endorsements on forms specified by the TOWN, duly authenticated, giving evidence of the insurance coverage required in this contract and other evidence of coverage or copies of policies as may be reasonably required by TOWN from time to time. Insurance shall be placed with insurers with a Best's Rating of no less than A:VII.

All subcontractors employed on the work referred to in this contract shall meet the insurance requirements set forth for Contractor. Contractor shall furnish certificates of insurance and endorsements for each

subcontractor at least five (5) days prior to the subcontractor entering the job site, or Contractor shall furnish Town an endorsement including all subcontractors as insureds under its policies.

The Town shall not be liable for any accident, loss, or damage to the work prior to its completion and acceptance, except as provided in Subsection 70-12, except as provided in Subsection 70-12, the Contractor shall save, keep, and hold harmless the TOWN, and their consultants, and each of their directors, officers, officials, employees, agents, and volunteers from all damages, costs, or expenses in law or equity that may at any time arise or be claimed because of damages to property or personal injury received by reason of or in the course of performing work, which may be caused by any willful or negligent act or omission by the Contractor or any of the Contractor's employees or any subcontractor.

The cost of such insurance shall be included in the various items of work in the Contractor's bid and no additional compensation for purchasing insurance or additional coverage needed to meet these requirements will be allowed.

In the event that any required insurance is reduced in coverage, canceled for any reason, voided or suspended, Contractor agrees that TOWN may arrange for insurance coverage as specified, and Contractor further agrees that administrative and premium costs may be deducted from payments due to the Contractor. A reduction or cancellation will be grounds for termination of this Agreement and will cause a halt to all work on the job until the insurance is reestablished.

END OF SECTION 70

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 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 as follows:

AOA	Time Periods AOA Can be Closed	Type of Communications Required When Working in AOA	Control Authority*
Runway 9-27; T/W A and Cross Taxiways, and Aprons	None	Two-Way Radio Tuned to 122.800 MHz	Airport Operations Manager

*Including driver training and/or safety training.

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 working 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 working days. Contract time based on working days shall be calculated weekly by the Resident Project Representative (RPR). The RPR will furnish the Contractor a copy of their weekly statement of the number of working days charged against the contract time during the week and the number of working days currently specified for completion of the contract (the original contract time plus the number of working days, if any, that have been included in approved Change Orders or Supplemental Agreements covering Extra Work).

The weekly statement of contract time charged is based on the following considerations:

(1) Time will be charged for days on which the Contractor could proceed with scheduled work under construction at the time for at least six (6) hours with the normal work force employed on such items. When normal work force is a double-shift, use 12 hours; and when the normal work force is on a triple-shift, use 18 hours. Conditions beyond the Contractor's control such as strikes, lockouts, unusual delays in transportation, temporary suspension of the scheduled work items under construction or temporary suspension of the entire work which have been ordered by the Owner for reasons not the fault of the Contractor, shall not be charged against the contract time.

(2) The RPR will not make charges against the contract time prior to the effective date of the notice to proceed.

(3) The RPR will begin charges against the contract time on the first working day after the effective date of the notice to proceed.

(4) The RPR will not make charges against the contract time after the date of final acceptance as defined in Section 50, paragraph 50-14, *Final Acceptance*.

(5) The Contractor will be allowed one (1) week in which to file a written protest setting forth their own objections to the RPR's weekly statement. If no objection is filed within such specified time, the weekly statement shall be considered as acceptable to the Contractor.

The contract time (stated in the proposal) is based on the originally estimated quantities as described in the Section 20, paragraph 20-05, *Interpretation of Estimated Proposal Quantities*. Should the satisfactory completion of the contract require performance of work in greater quantities than those estimated in the proposal, 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 contract time shall not consider either the cost of work or the extension of contract time that has been covered by change order or supplemental agreement and shall be made at the time of final payment.

80-07.2 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.

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.

Schedule	Liquidated Damages Cost	Allowed Construction Time
Total Project	\$3,000.00	115 Working Days

The contractor will be allowed one hundred fifteen (115) working days to complete construction of the total project. 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 waiver 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.

END OF SECTION 80

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 kg) 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	<p>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.</p> <p>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.</p> <p>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%.</p> <p>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.</p> <p>Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them.</p>

Term	Description
	<p>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.</p> <p>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.</p>
Rental Equipment	<p>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 <i>Payment for Extra Work</i>.</p>
Pay Quantities	<p>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.</p>

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, 5 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. However, this will not relieve the Contractor from corrective items required by the final acceptance of the project work.

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.
- m. Quality Control Program Test Result Summary.

END OF SECTION 90

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SPECIAL PROVISIONS

Part II – 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 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 three (3) 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 paragraph 100-8.
- (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, 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

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. Incidental to all bid items.

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.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901 shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

102-2.6 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. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence

shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

METHOD OF MEASUREMENT

102-4.1 Not applicable.

102-4.2 Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

BASIS OF PAYMENT

102-5.1 Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Temporary control features not covered by contract items that are ordered by the RPR will be paid for in accordance with Section 90, paragraph 90-05 *Payment for Extra Work*.

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

Item C-103 Storm Water Pollution Prevention Plan (SWPPP)

Description

103-1.1 This item consists of the preparation, implementation, maintenance, and monitoring of a Storm Water Pollution Prevention Plan (SWPPP) for the construction of this project to conform to all requirements of the Federal Aviation Administration, State of California Water Resources Control Board, and local agencies.

Preparation of SWPPP

103-2.1 The Contractor is required to hire a Qualified SWPPP Developer (QSD) to develop and submit for approval a Storm Water Pollution Prevention Plan (SWPPP), which includes not only the attachments but an Erosion Control Plan. The objectives of the SWPPP as stated in Section A of the State Water Resources Control Board Order No. 2010-0014-DWQ, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity are:

- To identify pollutant sources that may affect the quality of discharges of storm water associated with construction activity (storm water discharge) from the construction site, and
- To identify, construct, and implement storm water pollution prevention measures (control practices) to reduce pollutants in storm water discharges from the construction site both during and after construction is completed.

Therefore, the SWPPP to be developed by the Contractor's Qualified SWPPP Developer (QSD) must identify the Best Management Practices (BMPs), which are required for the Contractor's operations to meet these objectives. BMPs are measures or practices used to reduce the amount of pollution entering surface water and the storm sewer collection system. BMPs may take the form of a process, activity, or physical structure. The SWPPP must describe in detail the methods used to comply with those BMPs.

The plan must be approved by the engineer prior to any clearing, grading or excavation work. Acceptance of the plan does not preclude the Contractor from responsibility for taking the proper actions to prevent contaminants and/or sediments from leaving the construction site should any unforeseen circumstances occur. The Contractor must take immediate action if directed by the Engineer, or if the Contractor observes contaminants and/or sediments entering any surface or groundwater drainage, to prevent further storm water from entering the drainage.

To aid the Contractor in the preparation of the SWPPP, the SWRCB Order No. 2012-0006-DWQ can be found at the State of California Water Resources Control Board, Storm Water Program website at http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml. The SWPPP Template and Attachments are provided at the State of California Department of Transportation, Storm Water and Pollution Control website at <http://www.dot.ca.gov/hq/construc/stormwater> and should be followed by the Contractor during preparation of the SWPPP. Supporting information to be provided by the Owner for use by the Contractor during preparation of the SWPPP includes a topographic base map and a site map. Provision for Post-Construction Storm Water Management (Section A; Item 10) and Maintenance, Inspection and Repair (Section A; Item 11) must be addressed by the Owner for incorporation into the Contractor's "approved" SWPPP.

The final SWPPP must be submitted to the RPR for review and approval. This plan must be approved by the State of California Water Resources Control Board and the Airport. If necessary, it will be returned to the contractor for correction and update. Once the corrections have been made to the SWPPP and all actions called

for have been made, a final SWPPP must be resubmitted to the Engineer for approval at no extra cost. All requirements set forth in the SWPPP must be adhered to by the contractor during construction.

Method of Measurement

103-3.1 The method of measurement for preparation of a Storm Water Pollution Prevention Plan (SWPPP) including installation, monitoring, and implementation of all measures during the construction of this project will be lump sum.

Basis of Payment

103-4.1 The Contractor will be paid separately for the preparation of the SWPPP at the lump sum price bid for this work. The lump sum price bid must include all materials, equipment, time, and other work required to prepare the SWPPP and to implement, maintain, and monitor all measures required in the approved SWPPP.

Payment will be made under:

Item 103-4.1 SWPPP Submitted by Qualified SWPPP Developer (QSD) and SWPPP Implementation
And Monitoring - Lump Sum

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 - Lump Sum

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

ITEM C-106 MARKING AND LIGHTING OF CLOSED AIRPORT FACILITIES

Description

106-1.0 GENERAL. The construction of this project requires certain areas of the airfield to be closed to aircraft and operational traffic. Closure of these areas must be in accordance with construction plans. Marking of closed airfield facilities, temporary facilities, and contractor haul routes must be in accordance with these specifications and F.A.A. Advisory Circulars No. 150/5340-1, current edition, "Standards for Airport Markings", 150/5370-2, current edition, "Operational Safety on Airports During Construction" and the Construction Safety and Phasing Plan.

The airport will not be closed during construction of this project and aircraft operations on the runway and taxiways must be allowed and protected.

All existing runway lights, taxiway lights, NAVAIDs and all power, control, and communication cables must be maintained in operation at all times for those facilities which are not closed under this contract.

Closed Airport Facility Marking

106-2.1 BARRICADES. Any area that is closed for aircraft or vehicular traffic must have lighted barricades placed across the pavement as shown on the plans. These barricades must be maintained in good condition at all times during the closure or they must be repaired or replaced as directed by the Engineer.

In accordance with the Construction Safety and Phasing Plan, the Contractor must designate haul roads to construction areas and block access to construction areas by use of suitable lighted barricades. Barricades shall be Type II Barricades. Each Type II Barricade shall have one solar-powered light with red lenses, each controlled by photocells such that they are on continuous at night and off by day. Spacing between barricades shall not exceed 4 feet.

The Contractor must furnish, place, and maintain all barricades units for this project. The Contractor must supply sandbags for the barricades.

Barricades must be securely fastened or weighted so that they will not be disturbed by high winds or jet blast.

Barricades must be located as shown on the plans and as directed by the Resident Project Representative (RPR). At the completion of the project, all barricades must be removed from the site by the Contractor.

106-2.2 AIRFIELD GUIDANCE SIGN COVERS. Not applicable.

106-2.3 RUNWAY CLOSURE MARKERS. Not applicable.

Method of Measurement

106-3.1 Method of measurement for marking and lighting of closed Airport facilities will be Lump Sum.

Basis of Payment

106-4.1 Payment will be made at the contract lump sum price for marking and lighting of closed airport facilities.

This lump sum price will be full compensation for furnishing all labor, materials, tools, and incidentals necessary to perform this item of work including but not limited to furnishing, placing, maintaining, and removing barricades.

Payments will be made for marking and lighting of closed airport facilities on a monthly basis with the monthly progress payments. The percentage of marking and lighting of closed airport facilities payment made will be equal to the percentage of total project, completed, as determined by the Engineer.

Payment will be made under:

Item 106 – 4.1	Marking and Lighting of Closed Airport Facilities - Lump Sum
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**** END OF SECTION ****

Item C-110 Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (\bar{X}) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Owner's risk is the probability that material produced at the rejectable quality level is accepted.

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

- a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.
- b. Locate the random sampling position within the subplot in accordance with the requirements of the specification.
- c. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.
- d. Find the sample average (\bar{X}) for all subplot test values within the lot by using the following formula:

$$\bar{X} = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

Where: \bar{X} = Sample average of all subplot test values within a lot

x_1, x_2, \dots, x_n = Individual subplot test values

n = Number of subplot test values

- e. Find the sample standard deviation (S_n) by use of the following formula:

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \dots + d_n^2)/(n-1)]^{1/2}$$

Where: S_n = Sample standard deviation of the number of subplot test values in the set

d_1, d_2, \dots, d_n = Deviations of the individual subplot test values x_1, x_2, \dots from the average value \bar{X}

that is: $d_1 = (x_1 - \bar{X}), d_2 = (x_2 - \bar{X}) \dots d_n = (x_n - \bar{X})$

n = Number of subplot test values

f. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

$$Q_L = (X - L) / S_n$$

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L , using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

g. For double-sided specification limits (i.e., L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n$$

and

$$Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U , using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. If the values of Q_L fall between values shown on the table, use the next higher value of P_L or P_U . Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

$$A-1 = 96.60$$

$$A-2 = 97.55$$

$$A-3 = 99.30$$

$$A-4 = 98.35$$

$$n = 4$$

2. Calculate average density for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

$$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$$

$$X = 97.95\% \text{ density}$$

3. Calculate the standard deviation for the lot.

$$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2) / (4 - 1)]^{1/2}$$

$$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$$

$$S_n = 1.15$$

4. Calculate the Lower Quality Index Q_L for the lot. ($L=96.3$)

$$Q_L = (X - L) / S_n$$

$$Q_L = (97.95 - 96.30) / 1.15$$

$$Q_L = 1.4348$$

5. Determine PWL by entering Table 1 with $Q_L = 1.44$ and $n = 4$.

$$PWL = 98$$

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

$$A-1 = 5.00$$

$$A-2 = 3.74$$

$$A-3 = 2.30$$

$$A-4 = 3.25$$

2. Calculate the average air voids for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

$$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$$

$$X = 3.57\%$$

3. Calculate the standard deviation S_n for the lot.

$$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$$

$$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$$

$$S_n = 1.12$$

4. Calculate the Lower Quality Index Q_L for the lot. ($L = 2.0$)

$$Q_L = (X - L) / S_n$$

$$Q_L = (3.57 - 2.00) / 1.12$$

$$Q_L = 1.3992$$

5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and $n = 4$.

$$P_L = 97$$

6. Calculate the Upper Quality Index Q_U for the lot. ($U = 5.0$)

$$Q_U = (U - X) / S_n$$

$$Q_U = (5.00 - 3.57) / 1.12$$

$$Q_U = 1.2702$$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and $n = 4$.

$$P_U = 93$$

8. Calculate Air Voids PWL

$$PWL = (P_L + P_U) - 100$$

$$PWL = (97 + 93) - 100 = 90$$

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

A-3 = 99.30

A-4 = 98.35

A-2 = 97.55

A-1 = 96.60

2. From ASTM E178, Table 1, for $n=4$ an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

- a. For measurements greater than the average:

If (measurement - average)/(standard deviation) is less than test criterion,
then the measurement is not considered an outlier.

For A-3, check if $(99.30 - 97.95) / 1.15$ is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

- b. For measurements less than the average:

If (average - measurement)/(standard deviation) is less than test criterion,
then the measurement is not considered an outlier.

For A-1, check if $(97.95 - 96.60) / 1.15$ is greater than 1.463.

Since 1.435 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

Greater than $(97.95 + 1.463 \times 1.15) = 99.63\%$

OR

less than $(97.95 - 1.463 \times 1.15) = 96.27\%$.

Table 1. Table for Estimating Percent of Lot Within Limits (PWL)

Percent Within Limits (P _L and P _U)	Positive Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Percent Within Limits (P _L and P _U)	Negative Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

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 E178

Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

**TOWN OF MAMMOTH LAKES
MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING – PHASE 2**

SPECIAL PROVISIONS

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**TOWN OF MAMMOTH LAKES
MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING – PHASE 2**

SPECIAL PROVISIONS

PART III: SPECIAL CONDITIONS

(1) LOCATION

The site of the work is at Mammoth Yosemite Airport, Mammoth Lakes, California. Prior to the submission of his/her bid, each bidder shall visit the site and acquaint himself with local conditions, including but not limited to roads available, source of materials, water, electric power, and the relation of the finished grade to the existing grade.

(2) WORK TO BE DONE

The work to be done under this contract consists of furnishing all materials, plant and equipment, and performing all necessary labor for the construction of the work in accordance with the prepared plans, specifications, and special provisions and/or as directed by the Town or its authorized representative(s). This work consists of the following:

- Construction work for Multipurpose Building to Include SRE Components including grading, drainage, paving of the access road and apron, hardscapes, marking, fencing, building and building foundations and floor slabs and building interior and exterior utilities.

(3) PLANS AND SPECIFICATIONS

The work shall conform to the plans and specifications marked, *Mammoth Yosemite Airport, Multipurpose Building – Phase 2, Federal Project - AIP No. 3-06-0146-__*.

In case of conflict between the plans, specifications and other contract documents, these documents shall govern in the following order:

1st	Change Order or Supplemental Agreement
2 nd	Contract/Agreement
3 rd	Addenda to the Plans and Specifications
4 th	Bid Proposal
5 th	Technical Provisions
6 th	Special Conditions
7 th	Construction Plans
8 th	FAA General Contract Provisions
9 th	FAA General Construction Items
10 th	State Standard Plans and Specifications
11 th	FAA Specifications and Advisory Circulars

(4) LAWS TO BE OBSERVED

In addition to the general requirements included in Item 70-01 of the Federal General Provisions, Contractor's attention is directed to, and Contractor shall be responsible for conducting the project in compliance with all laws of the State of California governing the construction of public works, including, without limitation, the following:

- a. The California Health and Safety Code and all applicable administrative code regulations adopted pursuant thereto.
- b. All laws governing the employment of labor, qualifications for employment of aliens, payment of employees, convict-made materials, domestic and foreign materials, and accident prevention.
- c. Title XIX of the California Code of Regulations entitled, "Public Safety," Chapter 1, State Fire Marshal, subchapter 1, "General Fire and Panic Safety".
- d. General Industrial Safety Orders. Contractor, and all subcontractors, shall observe and conform to the provisions of Title VIII of the California Code of Regulations relating to safe and proper use, construction, disposal, etc., of materials, machinery, and building appurtenances as therein set forth.
- e. Rules and regulations of local utilities.
- f. Local Town and/or County ordinances.
- g. Code rules and safety orders. All work and materials shall be in full accordance with the latest rules and regulations of the State Fire Marshal; the National Board of Fire Underwriters; the National Electrical Code; State Industrial Accident Commission's Safety Orders; the safety orders of the Division of Industrial Safety; and Department of Industrial Relations.
- h. The Contractor shall conform to the requirements of Section 4216 of the Government Code, as latest amended, relating to subsurface installations.

All of the above laws and regulations are expressly incorporated in this contract and are as much a part of the Contract Documents as if they were incorporated in their entirety in these general provisions.

Nothing in the specifications is to be construed to permit work not conforming to the above, and expense in compliance with the above work shall be borne by the Contractor. Whenever the specifications and working details require higher standards or larger sizes than those required by the ordinances, codes and statutes, the specifications and working details shall take priority over the ordinances, codes and statutes.

The Contractor shall not interpret the enumeration set forth above as being a complete listing of all applicable laws. It is the Contractor's responsibility to keep informed regarding the requirements of all applicable laws and to obey them, and Contractor agrees by execution of the Contract Documents to do so at his/her sole cost, expense, and risk.

All work, materials, work safety procedures and equipment shall be in full accordance with the latest Cal/OSHA rules and regulations.

Contractor warrants that Contractor and each of his/her subcontractors shall, in performance of this contract, comply with each and every compliance order issued pursuant to Cal/OSHA. The Contractor assumes full and total responsibility for compliance with Cal/OSHA standards by his/her subcontractors as well as by the Contractor. The cost of complying with any compliance order and/or payment of any penalty assessed pursuant to Cal/OSHA shall be borne by the Contractor. Contractor shall save, keep and hold harmless the Owner, and all officers, employees, and agents thereof, from all liabilities, costs, or expenses, in law or in equity, that may at any time arise or be set up because of Contractor's or a subcontractor's non-compliance or alleged non-compliance with Cal/OSHA requirements. Nothing contained herein shall be deemed to prevent the Contractor and his/her subcontractors from otherwise allocating between themselves responsibility for compliance with Cal/OSHA requirements; provided, however, that the Contractor shall not thereby be, in any manner whatsoever, relieved of his/her responsibility to the Owner as hereinabove set forth.

(5) CALIFORNIA AIR RESOURCES BOARD (“CARB”) REGULATIONS

Contractor shall comply, and shall ensure all subcontractors comply, with all applicable requirements of the most current version of the regulations imposed by California Air Resources Board (“CARB”) including, without limitation, all applicable terms of Title 13, California Code of Regulations Division 3, Chapter 9 and all pending amendments (“Regulation”).

Throughout the Project, and for three (3) years thereafter, Contractor shall make available for inspection and copying any and all documents or information associated with Contractor's and its subcontractors' fleets including, without limitation, the Certificates of Reported Compliance (“CRCs”), fuel/refueling records, maintenance records, emissions records, and any other information the Contractor is required to produce, keep or maintain pursuant to the Regulation upon two (2) calendar days' notice from the Town.

Contractor shall be solely liable for any and all costs associated with compliance with the Regulation as well as for any and all penalties, fines, damages, or costs associated with any and all violations, or failures to comply with the Regulation. Contractor shall defend, indemnify and hold harmless the Town, its officials, officers, employees and authorized volunteers free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with the Regulation.

(6) LAWS AFFECTING PUBLIC WORKS

Attention to bidders is called to necessity of being familiar with the various Federal, state and local laws affecting public work, especially (but not limited to) those laws relating to hours of employment, minimum wages, payment of wages, sanitary and safety conditions for workers, worker's compensation insurance, type and kind of materials that can be used, non-discrimination in employment and affirmative action programs. Federal monies are to be utilized by Owner for this Project, and Contractor shall comply with applicable regulations and hold harmless the Owner for its failure to comply. Certain of those provisions are set forth herein. The existence of these provisions does not excuse the Contractor from complying with other statutory requirements or provisions which are not set forth in these contract documents.

(7) LIMITS OF CONSTRUCTION

The Contractor's personnel and equipment shall be limited to the construction areas shown on the plans and along the adjacent public areas by permission of the Resident Project Representative (RPR). Contractor agrees to implement such security measures as are necessary to assure compliance with Federal Aviation Administration, state, and local airport regulations. Access to runways, taxiways and aircraft parking aprons for any reasons other than construction will not be permitted.

(8) PROGRESS OF WORK AND TIME OF COMPLETION

Contract Time: The contractor will be allowed one hundred fifteen (115) working days for the completion of the total project. All work covered by this contract including inspection and approval shall be completed within the working days allowed from the date of written notice by the Town to begin work. The counting of working days shall begin the first working day following receipt of Notice to Proceed issued by the Owner, but no later than ten (10) working days after receipt of Notice to Proceed. Due to typical winter weather conditions, construction cannot take place between October 15 and approximately May 15 (exact spring date is dependent on spring snow melt).

Liquidated damages will be charged at the rate of \$3,000.00 per calendar day for each day that the contract time exceeds the total contract time for the project.

Before beginning any work on this project, the Contractor shall prepare and submit for approval a detailed scheduling plan and staging plan showing time and type of work to be performed.

If said Contractor shall be delayed in said work by the acts or neglect of said Owner, or its employees, or those under it by contract or otherwise, or by changes ordered in the work, or by strike, lockouts, fire, unusual delay in transportation, unavoidable casualties or any causes beyond the Contractor's control, or by delay authorized by the Owner, or by any cause which the Owner shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the Owner agrees to in writing.

This article does not exclude the recovery of damages for delay by either party under other provisions in the Contract Documents.

(9) CLOSURES OF RUNWAY, TAXIWAYS, AND APRONS

The runway, taxiways, and aprons will remain open at all times during the construction of this project.

There will be no need for the Contractor to cross a runway or taxiway during the construction of this project.

Construction will be limited to no closer than 250 feet from the active runway centerline and 59 feet from the active taxiway centerline. The Runway Safety Area beyond the runway threshold will be maintained at 600 feet.

Where noted Contractor shall provide a qualified flagman to monitor airport frequency 122.8 MHZ and control Contractor's men and equipment anytime Contractor is crossing an active taxiway. Contractor's qualified flagman will complete training course provided by the Airport and will be approved by the Airport. Contractor will provide all necessary radios to monitor airport frequency 122.8.

Where noted Airport will provide a qualified flagger to monitor airport frequency 122.8 MHZ and control Contractor's men and equipment anytime Contractor is crossing an active runway.

Contractor shall have on site a vacuum sweeper to keep clean all haul roads on existing airfield pavements. Sweepers shall only have nylon bristles, no metal bristles will be allowed on the airport.

Lighted barricades shall be erected at the locations as shown on the Construction Safety and Phasing Plan, Sheet No. A01-02, and as directed by the RPR. Contractor shall at all times maintain automobile access to the airport.

Contractor shall furnish, install, and maintain lighted Type II barricades during construction of the project as shown on Sheet No. A-01-02, Construction Safety and Phasing Plan. Payment for furnishing, installing, and maintaining Type II barricades will be made under Item C-106 of these specifications.

It shall be the Contractor's responsibility to require all personnel to observe the safety requirements of the Airport to restrict all personnel and equipment to the work and storage areas assigned to the Contractor.

(10) CONSTRUCTION SCHEDULE

The sequence of construction shall be as shown on the plans or as directed by the RPR.

The building concrete floor slab shall not be constructed and left exposed over the winter. The building shell must be completed and closed in over the slab prior to winter and freezing temperatures to protect the concrete slab from freezing.

The work shall be accomplished in one work zone with one phase

Work Phase	Contractor's Work	Facility Closure
1-1	Building Site, Apron and ARFF Access Road	Hangar Access Road

Work in Phase 1-1 will require closure of the hangar access road. Access to the East Hangars will be coordinated between Airport Operations, FBO, and Contractor. The route to the hangars across the apron and by way of Taxiway A will be controlled by flaggers during Phase 1-1 closures.

At the Preconstruction Conference or two weeks prior to the start of work, whichever is greater, the Contractor shall provide a detailed two-week lookahead plan and schedule showing limits of proposed work and the locations of barricades. Contractor will give the Airport two weeks' notice prior to start of construction.

The Contractor shall develop a schedule of operations in graphic form. This schedule shall show the proposed construction schedule for various items and phases of work and shall also provide space to show the current status of the work. This schedule shall show both calendar and working days on the construction timeline.

The Contractor shall submit the schedule for approval. No work shall be started until the construction schedule has been approved.

The Contractor shall maintain a copy of this schedule on the project site. A two-week look-ahead schedule shall be updated and submitted to the RPR for approval weekly at the weekly construction meeting.

(11) GREATER SAGE GROUSE PRECONSTRUCTION SURVEY.

Mammoth Yosemite Airport is designated as a potential critical habitat for the Greater Sage Grouse. Mammoth Yosemite Airport is required to conduct a Greater Sage Grouse preconstruction survey prior to the start of any work on this project. Contractor shall give the Airport 4 weeks' notice prior to start of any construction (including haul road clearing and equipment mobilization) to allow time for the Greater Sage Grouse preconstruction survey.

(12) WATERING.

Water, when required, shall be applied at the locations, in the amounts, and during the hours, including nights, as directed by the RPR. Water for purposes of this contract shall be furnished by the Contractor. Conveyance of water to the points of usage shall be the Contractor's responsibility. Contractor shall supply necessary hoses to supply his requirements. The equipment used for watering shall be of ample capacity and of such design as to assure uniform application of water in the amounts directed by the RPR.

The contractor shall obtain all permits and pay all fees as required for the development of the water supply.

No separate payment shall be made for watering, but it shall be considered as a subsidiary obligation of the Contractor covered under the respective items of work.

(13) HAULING ROUTES ON AIRPORT PROPERTY

In order to avoid confusion with vehicles during the construction and to avoid damage to the existing pavement and to the adjacent lands, the Contractor's equipment shall be restricted to certain hauling routes as shown on the plans. Certain haul roads are on the secure portion of the airfield. These haul roads will only be open to the Contractor during the normal work hours. The roads that are outside of the airport secure

area will be open to the Contractor at all times. Portions of the road referred to in this paragraph may consist of unimproved ground. If the Contractor should find that it is desirable to improve this road, he may do so but will receive no payment for any improvements that he may make. At certain areas this road may cross existing roads or taxiways. It shall be the responsibility of the Contractor to provide adequate safeguards, including flaggers, so that the operation of the Airport or public travel will not be hindered. In addition, it shall be the responsibility of the Contractor to repair any damage caused by his equipment to these paved areas. Vehicle loads shall not exceed legal highway load limits.

Access to the work areas will be off Airport Road onto the airport service road. The Contractor shall obtain all necessary permits to enter the work areas from these roads; shall provide the necessary signs, marking and flaggers to protect the public in these areas. The Contractor shall grade, maintain and control dust on these haul roads during use.

Contractor shall construct a 24' haul road from the end of Airport Road to the Contractor's Staging Area west of the water storage tank and pump house. Contractor shall maintain this haul road for all construction equipment and material deliveries for the duration of the project. Contractor and Airport shall coordinate the location of the haul road. This Contractor's haul road accesses the airport through a 4-strand barb wire fence. Contractor shall install a temporary gate at this entrance to the airport property.

At the completion of the work, all haul roads in unpaved areas shall be restored to the conditions existing prior to the start of the work.

(14) CONTRACTOR'S STORAGE AND STAGING AREA

The proposed location has been shown on the plans for the Contractor's Storage and Staging Area. It shall be the responsibility of the Contractor to determine the availability of water, power, gas, and electricity for this area. He shall make all necessary arrangements to provide these services to meet his requirements and shall pay the specified utility company for such services.

Stockpiles shall be limited to a height of four (4) feet and shall be clearly marked and lighted during hours of restricted visibility or darkness.

Temporary stockpile locations can be coordinated with the Airport Operations Manager

The Contractor shall supply and maintain at his expense such toilet and other sanitary facilities as are necessary for his personnel in this area. Such facilities shall conform to the requirements of the Mono County Health Department.

There are no disposal sites located on Airport property. Contractor shall be responsible for hauling off site all demolished and excavated materials not reused as approved fill. Contractor shall secure a disposal site and obtain all permits. No separate payment will be made for disposal site, disposal permit, or hauling off site. Contractor shall be responsible for all dump fees.

At completion of the contract, the Contractor shall remove all plant, equipment, stockpiles, etc., from the work area. Contractor shall restore all work areas and haul roads to the original condition prior to any work in the area. Contractor shall not receive any separate payment for any of this restoration or clean up.

(15) MARKING OF CONSTRUCTION EQUIPMENT

All construction equipment shall display orange and white checkered flags, 3'x3'. These flags shall be so located on the equipment as to be plainly visible to all aircraft. No equipment shall be parked on or over the paved area of the airfield or within the runway protection zone. Parking areas for equipment will be designated by the RPR. During any night work all equipment shall use flashing amber lights located in clearly visible locations.

(16) AIRCRAFT RIGHT OF WAY AND ACCESS

Aircraft shall at all times have the right of way. Aircraft shall have access to all airport facilities at all times except when surfaces are closed. All aircraft shall at all times be protected from all equipment, materials, and dust. Contractor will be required to initiate effective dust control measures as needed at no additional cost to Owner.

(17) PROTECTION OF CABLES, CONTROLS, NAVAIDS AND WEATHER BUREAU FACILITIES

Due to the critical nature of certain utilities to the operation of the Airport, the following Special Provisions for Protection of Cables, Controls, and Navaids shall apply:

The Contractor is hereby informed that there are installed on the Airport certain structural facilities served by underground cable and other electric power cables serving other facilities. Such facilities and electric cables must be fully protected during the entire construction time. Work under this contract can be accomplished in the vicinity of these facilities and cables only at approved periods of time. Approval is subject to withdrawal at any time because of changes in weather, emergency conditions on the existing airfield areas, anticipation of emergency conditions, and for any other reason determined by the RPR acting under the orders and instructions of the airport management. Any instructions to the Contractor to clear any given area, at any time, by the RPR or Airport Management (by radio or other means) shall be immediately executed. Construction work shall be commenced in the cleared area only when additional instructions are issued by the proper authorities.

Power and control cables leading to and from any facilities will be marked in the field by the RPR for the information of the Contractor before any work in their general vicinity is started. Thereafter, through the entire time of this construction, they shall be protected from any possible damage, including crossing with unauthorized equipment, etc.

These special provisions intend to make perfectly clear the need for protection of cables and other electrical facilities by this Contractor at all times.

The Contractor shall immediately repair, with identical material by skilled workmen, any underground cables serving airport facilities which are damaged by his workmen, equipment, or work. Prior approval of the RPR or of the representative designated by Airport Management must be obtained for the materials, workmen, time of day or night, and for the method of repairs for any temporary or permanent repairs the Contractor proposes to make to any airport facilities and cables damaged by this Contractor.

It is recognized that the Owner will incur costs for employees' salaries, engineering fees and otherwise in connection with the damage, inspection and repair of any such damage caused by the Contractor; and consequently that the Owner may incur loss of income by reason of the diversion of aircraft traffic from the airport resulting from interruption of the use of airport facilities; and that such expenses and loss of income are not measurable now and may not be reasonably ascertainable at the time of any incident caused by the Contractor. The Owner and the Contractor hereby agree to the assessment of liquidated damages in lieu of such expenses or other damages incurred by the Owner. In addition to the obligation of the Contractor to immediately repair any cables or facilities damaged by the Contractor as set forth above, the sum of \$300 shall be deducted from any money due the Contractor; or if no money is due the Contractor, the Owner shall have the right to recover said sum or sums from the Contractor, from the surety, or from both. The amount of these deductions is not considered a penalty.

(18) AIRPORT SECURITY

During the course of the contract, the Contractor shall be responsible for maintaining security against unauthorized access to the Airport. The Contractor will be held responsible for any fines, damages, or civil penalties filed against the Owner for the Contractor's failure to maintain the regulations set forth herein.

In accordance with the requirements of the Federal Aviation Administration as set forth in FAR 107.11(F), the Contractor shall take all steps necessary to assure Owner that the backgrounds of all employees have been checked to the extent necessary to assure that permitting them unescorted access to any area on the airport controlled for security reasons is appropriate. This background check, to the extent allowable by law, shall include at a minimum references and prior employment histories to the extent necessary to verify representations made by the employee relating to employment in the preceding 5 years.

All equipment, vehicle and personnel travel shall be restricted to designated work sites.

Only vehicles used for construction purposes shall enter the work boundaries. Contractor personnel may, however, be allowed to park their personal vehicles within a designated staging area. All vehicles shall have identifying markings on them which show that they are authorized on the Airport. All personnel working on the airport shall wear identification such as badges or hard hats with contractor's logo to show that they are authorized on the airport.

All security measures must be coordinated with Airport Management and the RPR and must be approved prior to implementation.

Only Contractor and subcontractor employees are permitted in the work sites. They must enter and exit the airport areas restricted to public access and airport operations area only through the designated Contractor gate. Contractor shall control this gate such that unauthorized vehicles are not allowed access to the Airport.

All gates used by the Contractor shall remain closed at all times except when authorized equipment is actually entering the airport. During continuous use of a gate for delivery of equipment or materials, Contractor shall request that the airport place the gate in a locked open state. Contractor shall provide a flagger, trained for the airport and place the flagger at the open gate to keep unauthorized personnel and wildlife from entering the airport. The fence, designated Contractor gate, and secure areas on the airport are shown on the CSPP Drawing. Contractor will post a sign reading "Contractor's Work Entrance Only." Contractor will be responsible for security of the entrance during Contractor's working hours.

Contractor shall maintain access to the airport through one of the gates at all times. Contractor shall install "Airport Access" signage to direct traffic to the gate in use.

Contractor shall be required to obtain airport security badges from the Airport office. Cost of badging shall be the responsibility of the contractor (\$90 per badge, \$30 per renewal of existing badge). All applicants will be required to fill out an application in person at the airport office and have their photo taken. One government issued form of identification will be required to be presented.

Airport security badging will only be required for the Contractor's Foreman and any on-site supervisors. Contractor shall have enough personnel badged such that all workers on the airfield can be within visual contact and under control of a badged supervisor. Security badging can take up to 7 calendar days to complete after the application is submitted, Contractor shall plan accordingly to have the proper number of employees badged prior to issuance of the Notice to Proceed.

In the event of an emergency, personnel and equipment shall be moved immediately at the direction of Airport Management or the RPR.

Contractor's personnel and equipment shall remain outside of designated Security Identification Display Area (SIDA), located on the terminal apron, at all times.

Contractor shall abide by all TSA regulations and restrictions when airline aircraft are operating on the runway, taxiways, and aprons. Contractor shall register all personnel with Airport and designate lead personnel for access badges minimum of 1 week prior to start of work at Contractor's expense.

- (19) **AVIATION SAFETY REQUIREMENTS DURING CONSTRUCTION (AC 150/5370-2G)** - An Airport Construction Safety and Phasing Plan (CSPP) has been prepared to outline all safety issues related to the proposed construction. This CSPP is included in these specifications as Appendix C. The Contractor will be required to submit all reports designated in the CSPP and implement all safety measures set forth in this plan.

A. **SAFETY PLAN COMPLIANCE DOCUMENT** – Prior to issuance of Notice to Proceed by the Owner, the Contractor shall complete a Safety Plan Compliance Document (SPCD) detailing how he/she will comply with the Construction Safety and Phasing Plan (CSPP). 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. 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.

This SPCD shall be submitted to the Owner for approval prior to start of construction and shall include the following:

- (1) **Coordination.** Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
- (2) **Phasing.** Discuss proposed construction schedule elements, including:
 - (a) Duration of each stage.
 - (b) Daily start and finish of construction, including "night only" construction.
 - (c) Duration of construction activities during:
 - i. Normal taxiway operations.
 - ii. Closed taxiway operations
- (3) **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.
- (4) **Protection of NAVAIDs.** Discuss specific methods proposed to protect operating NAVAIDs.
- (5) **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.
 - i. Types of radios and backup capabilities.
 - ii. Who will be monitoring radios.

- iii. Whom to contact if the Airport cannot reach the contractor's designated person by radio.
- (d) Details on how the contractor will escort material delivery vehicles.
- (6) **Wildlife management.** Discuss the following:
 - (a) Methods and procedures to prevent wildlife attraction.
 - (b) Wildlife reporting procedures.
- (7) **Foreign Object Debris (FOD) management.** Discuss equipment and methods for control of FOD, including construction debris and dust.
- (8) **Hazardous material (HAZMAT) management.** Discuss equipment and methods for responding to hazardous spills.
- (9) **Notification of construction activities.** Provide the following:
 - (a) Contractor points of contact.
 - (b) Contractor emergency contact.
 - (c) Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.
 - (d) Batch plant details, including 7460-1 submittal, if applicable.
- (10) **Inspection requirements.** Discuss daily (or more frequent) inspections and special inspection procedures.
- (11) **Underground utilities.** Discuss proposed methods of identifying and protecting underground utilities.
- (12) **Penalties.** Penalties are identified in the CSPP and do not require an entry in the SPCD.
- (13) **Special conditions.** Discuss proposed actions for each special condition identified in the CSPP.
- (14) **Runway and taxiway visual aids.** Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:
 - (a) Equipment and methods for covering signage and airfield lights.
 - (b) Equipment and methods for temporary closure markings (paint, fabric, other).
 - (c) Types of temporary Visual Guidance Slope Indicators (VGSI).
- (15) **Marking and signs for access routes.** Discuss proposed methods of demarcating access routes for vehicle drivers.
- (16) **Hazard marking and lighting.** Discuss proposed equipment and methods for identifying excavation areas.
- (17) **Protection of runway and taxiway safety areas, including object free areas, obstacle free zones, and approach/departure surfaces.** Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:

- (a) Equipment and methods for maintaining Runway and Taxiway Safety Area standards.
 - (b) Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
- (18) Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

B. GENERAL SAFETY REQUIREMENTS

Throughout the construction project, the following safety and operational practices should be observed:

- Operational safety should be a standing agenda item during progress meetings throughout the construction project.
- The Contractor and airport operator shall perform onsite inspections throughout the project, with immediate remedy of any deficiencies, whether caused by negligence, oversight, or project scope change.
- Airport aprons and taxiways remain in use by aircraft to the maximum extent possible.
- Aircraft use of areas near the Contractor's work will be controlled to minimize disturbance to the Contractor's operation.
- Contractor, sub-contractor, and supplier employees or any other unauthorized persons must be restricted from entering or remaining in airport area that would be hazardous.
- Construction that is within the safety area of an active runway, taxiway or apron that is performed under normal operational conditions must be performed when the runway, taxiway or apron is closed or restricted and initiated only with prior permission from the airport operator.
- The contracting officer, airport operator, or other designated airport representative may order the Contractor to suspend operations; move personnel, equipment, and materials to a safe location; and stand by until aircraft use is completed.

C. CONSTRUCTION MAINTENANCE AND FACILITIES MAINTENANCE

Before beginning any construction activity, the contractor must, through the airport operator, give notice (using the Notice to Airmen (NOTAM) System) of proposed location, time, and date of commencement of construction. Upon completion of work and return of all such areas to standard conditions, the contractor must, through the airport operator, verify the cancellation of all notices issued via the NOTAM System. Throughout the duration of the construction project, the contractor must:

- Be aware of and understand the safety problems and hazards described in AC 150/5370-2G, *Operational Safety on Airports During Construction*.
- Conduct activities so as not to violate any safety standards contained in AC 150/5370-2 or any of the references therein.
- Inspect all construction and storage areas as often as necessary to be aware of conditions.
- Promptly take all actions necessary to prevent or remedy any unsafe or potentially unsafe conditions as soon as they are discovered.

D. APPROACH CLEARANCE TO RUNWAYS

Runway thresholds must provide an unobstructed 20:1 approach surface ratio over equipment and materials.

E. RUNWAY AND TAXIWAY SAFETY AREA (RSA and TSA)

A runway must be closed/partially closed if construction activity will occur within the RSA. Construction activity within the TSA/obstacle-free zone is permissible when the taxiway is open to aircraft traffic if adequate wingtip clearance exists between the aircraft and equipment/material; excavations, trenches, or other conditions are conspicuously marked and lighted; and local NOTAMs are in effect for the activity.

(1) Procedures for protecting runway edges

- Limit construction to no closer than 150 feet from the runway centerline, unless the runway is closed or restricted to aircraft operations requiring lesser standard RSA that is equal to the RSA available during the construction.
- Prevent personnel, material, and/or equipment from penetrating OFZ.
- Coordinate construction activity with the Airport Management, FAA Regional Airports Office, or Airports District Office and through the airport operator issue an appropriate NOTAM.
- Runway 9-27 has a Runway Design Group (RDG) of B III and the runway safety area extends 150 feet each side of centerline. No work shall be performed in the RSA when the surfaces are open for aircraft operations.

(2) Procedures for Protecting Runway Ends

- Maintain the RSA from the runway threshold to a point at least the distance from the runway threshold as existed before construction activity, unless the runway is closed or restricted to aircraft operations requiring a RSA that is equal to the RSA length available during construction. This may involve the use of declared distances and partial runway closures.
- Ensure all personnel, materials, and/or equipment are clear of the applicable threshold siting criteria surface as defined in Article 303, "Runway End Siting Requirements," of AC 150/5300-13B.
- Prevent personnel, material and/or equipment, from penetrating the Object Free Zone (OFZ).
- Ensure adequate distance for blast protection is provided, as needed.
- Coordinate construction activity with the Airport Management, FAA Regional Division Office, and, through the airport operator, issue an appropriate NOTAM.
- The safety areas beyond the thresholds to Runway 9 and Runway 27 are as follows:

Runway End Number	Aircraft Approach Category	Airplane Design Group	Minimum Safety Area Behind Threshold	Minimum Unobstructed Approach Slope
9	B	III	600 ft.	20:1
27	B	III	600 ft.	20:1

F. CLOSED RUNWAY MARKINGS AND LIGHTING

No closed runway marking is required in this project.

G. HAZARDOUS AREA MARKING AND LIGHTING

Hazardous areas on the movement area will be marked with barricades as shown on the plans. The markings restrict access and make hazards obvious to aircraft, personnel, and vehicles. During periods of low visibility and at night, identify hazardous areas with red flashing lights having at least five (5) candela effective intensity for night marking. The hazardous area marking and lighting will be supplied by the contractor, and are depicted on the plans. There will be no separate payment for hazardous area marking and lighting.

H. VEHICLE OPERATION MARKING AND CONTROL

- (1) When any vehicle, other than one that has prior approval from the airport operator, must travel over any portion of an aircraft movement area, it shall be escorted and properly identified. To operate in those areas during daylight hours, the vehicle must have a flag or beacon attached to it. Any vehicle operating on the movement areas during hours of darkness or reduced visibility should be equipped with a flashing dome type light, the color of which is in accordance with local or state codes.
- (2) It may be desirable to clearly identify the vehicles for control purposes by either assigned initials or numbers that are prominently displayed on each side of the vehicle. The identification symbols should be a minimum 8-inch, block-type characters of a contrasting color, and easy to read. They may be applied either by using tape or a water-soluble paint to facilitate removal. Magnetic signs are also acceptable. In addition, all vehicles must display identification media as specified in the approved security plan.
- (3) Employee parking shall be as shown on the Construction Layout and Safety Plan and designated by the RPR.
- (4) Access to the job site shall be as shown on the Construction Layout and Safety Plan and as designated by the RPR.
- (5) At 14 CFR part 139 certificated airports, all vehicle operators having access to the movement area shall be familiar with airport procedures for the operation of ground vehicles and the consequences of non-compliance. Mammoth Yosemite Airport is a Part 139 certificated airport.
- (6) If the airport is certificated and/or has a security plan, the airport operator should check for guidance on the additional identification and control of construction equipment.

I. NAVIGATIONAL AIDS

The Contractor must not conduct any construction activity within navigational aids' restricted areas without prior approval from the local FAA Airway Facilities sector representative. Navigational aids include instrument landing system components and very high-frequency omnidirectional range, airport surveillance radar. Such restricted areas are depicted on construction plans.

J. LIMITATIONS ON CONSTRUCTION

Additional limitations on construction shall include:

- (1) Prohibit open-flame welding or torch cutting operations unless adequate fire safety precautions are provided and these operations have been authorized by the RPR.
- (2) Prominently mark open trenches, excavations, and stockpiled materials at the construction site with alternating orange and white flags and light these obstacles during hours of restricted visibility and darkness.

- (3) Marking and lighting of closed, deceptive, and hazardous areas on airports, as appropriate.
- (4) Constrain stockpiled material to prevent its movement as a result of the maximum anticipated aircraft blast and forecast wind conditions.

K. RADIO COMMUNICATIONS

Vehicular traffic located in or crossing an active movement area must have a working two-way radio in contact with the Airport Manager or be escorted by a flag person. The driver, through personal observation, should confirm that no aircraft is approaching the vehicle position. Construction personnel may operate in a movement area without two-way radio communication provided a NOTAM is issued closing the area and that the area is properly marked to prevent incursions. Two-way radio communications are required on Unicom Frequency 122.800 MH between contractors and the Airport Manager. Continuous monitoring is required.

L. DEBRIS

Waste and loose material must not be placed in active movement areas. Materials tracked onto these areas must be removed continuously during the work project.

(20) PRECONSTRUCTION CONFERENCE

After full execution of the construction contract by the contractor, and prior to the issuance of a Notice to Proceed, the RPR will schedule a preconstruction conference to review the project with the Contractor, the City and the FAA, as applicable. The Contractor's representatives at this meeting shall include all upper-level superintendents for the work and may include major subcontractors.

During the meeting, the contractor shall submit to the Engineer:

- a) The Contractor's emergency telephone number and the name of the Contractor's emergency contact person
- b) Construction schedule.
- c) Quality Control Plan (Submitted 10 calendar days before the Quality Control (QC)/Quality Assurance (QA) workshop – See Item C-100 of these specifications.)
- d) Storm Water Pollution Prevention Plan (SWPPP)
- e) Safety Plan Compliance Document.

Construction on this project cannot begin until these submittals have been reviewed and approved.

(21) SUBMITTALS AND/OR SHOP DRAWINGS

- a) The specifications indicate the desired equipment and materials as to type and quality. Wherever proprietary names are listed in these specifications, it shall be interpreted that the words "or approved equal" follow, unless otherwise specified. The words "or approved equal" shall be interpreted as meaning equal in every respect as determined by the RPR.
- b) Prior to or at the Preconstruction Conference, the Contractor shall submit to the RPR for approval a complete list of all equipment and materials intended to be used on the job. The list shall include the following information for each item.

Name of Item
FAA Specifications Number (If Any)
Manufacturer's Name
Manufacturer's Catalog Number

Size, Type and Rating

- c) Prior to or at the Preconstruction Conference the Contractor shall submit to the RPR for approval the following:

Construction Schedule
Safety Plan Compliance Document
Storm Water Pollution Prevention Plan (SWPPP)

The Quality Control Program shall be submitted 10 calendar days before the Quality Control (QC)/Quality Assurance (QA) workshop, as described in Item C-100 of these specifications.

Construction on this project cannot begin until these submittals have been reviewed and approved.

- d) Prior to or at the Preconstruction Conference, the Contractor shall submit to the RPR for approval a Schedule of Values for all Lump Sum items included in the contract. This schedule shall include the item, description, total contract amount, and scheduled payment amounts. The schedule shall be made out in such form as the Airport, RPR, and Contractor may agree upon and be supported by evidence as to its correctness. This schedule, when approved by the Airport and the RPR, will be used as the basis for making progress payments on all lump sum items, except for those that have a payment schedule stipulated in their respective specification sections. The Contractor shall take note of the schedules of partial payments that are included in Item C-105, Mobilization, C-106 Marking and Lighting of Closed Airport Facilities, etc.
- e) Within five (5) calendar days after RPR's approval of the equipment and materials list, the Contractor shall submit to the RPR for written approval copies of all shop drawings and all equipment and materials submittals. The shop drawings and equipment/materials submittals shall be complete showing all details.
- f) The Contractor shall review and sign all shop drawings prior to submitting same for RPR's approval. All shop drawings received without the Contractor's signature will be subject to return without review or comment.

It shall be the responsibility of the Contractor to specifically point out any variation or discrepancy between the shop drawings or manufacturers' instructions he submits and the Contract Documents. Failure by the Contractor to identify in his letter of transmittal any variation, discrepancy, or conflict with the contract drawings may result in the shop drawing or submittal being returned to the Contractor for resubmittal.

- g) The shop drawings shall show completely the work to be done, but approval by the RPR shall not be construed as waiving any of the requirements of the contract and particularly shall not be construed as relieving the Contractor of full responsibility for fitting his equipment in the spaces provided; or from responsibility to fulfill the contract at no extra cost to the Owner, within the completion time.
- h) The Contractor shall submit electronic copies of all shop drawings and equipment and materials submittals. Fax submittals will only be acceptable as preliminary submittals and are to be followed up with hard copies. Email submittals will be acceptable provided they are legible.

(22) SUBMITTAL AND SHOP DRAWING APPROVALS.

The RPR will review all submittals and shop drawings and return them to the Contractor. If the Contractor's submittal or shop drawings are incomplete or the product submitted does not meet specification

requirements, the RPR will reject the submittal or shop drawing and the Contractor will be required to resubmit. Resubmittals shall address all comments from the RPR. Partial resubmittals may be returned without action. The review of the first submittal and one resubmittal on any item will be made by the RPR at no cost to the Contractor. The Contractor will be charged for and shall reimburse the Owner for the RPR's costs of reviewing the second and each subsequent resubmittal. The RPR's costs will be charged to the Owner and deducted from the Contractor's progress payments.

(23) VIDEOTAPING

A minimum of one (1) week prior to start of construction, the Contractor shall have video taken where construction is to take place. Such video records/documentation shall be provided to the RPR before construction commences. These videos shall be narrated and shall serve as a record of existing conditions for disputes arising from restoration, and should therefore be taken along the line of construction and site access and staging areas at sufficient detail and in color as necessary to clearly depict details of existing conditions. All videos shall be indexed and catalogued in such a manner that each photographed area is readily identifiable, and shall also indicate the date and time (hour, minutes, and seconds) on which the video was made. The Contractor shall also have video taken of any unusual conditions encountered during construction that are not already a matter of photographic record. In any areas where existing conditions cannot be determined by means of video, the area shall be restored as approved by the RPR at Contractor's expense. All video shall become the property of the Owner.

No separate payment will be made for video documentation.

(24) QUALITY CONTROL PROGRAM

The Contractor is responsible for all Quality Control (QC) during the construction of this project, including testing and inspection. The Owner is responsible for Quality Assurance (QA) to confirm that all work has been performed in accordance with the plans and specifications. A Construction Management Plan has been prepared and is included in Appendix D of these specifications. This plan outlines how this project will be managed during construction and includes construction management personnel and resumes, inspection procedures and frequencies, submittal process, quality control testing, quality assurance testing, and test result documentation. The plan and Section C-100 of the F.A.A. General Construction Items shall be used as a guide to the Contractor in preparing Contractor's Quality Control Program for this project.

The Contractor shall present his/her Quality Control Program to the RPR for review and approval. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Program has been approved by the RPR.

For each item of work, the Contractor shall maintain a summary report of all testing and inspection results. This summary report shall tabulate the daily test results for each item of work. The summary reports shall be updated daily and formally submitted to the RPR as requested, but not less than once per week. If these summary reports are not received by the RPR by Monday morning of each week during construction, the work will be shut down and Contractor shall not be allowed to proceed with the work until the reports have been submitted.

Simultaneously with the contractor's request for final payment, the contractor shall submit electronic sets of Quality Control Reports consisting of summaries of all testing and inspections conducted during the construction of the project. All test results shall be included in a typed summary table to be approved by the RPR.

(25) CONTRACTOR'S AS-BUILT DRAWINGS

Contractor shall be provided one extra set of working plans and specifications; which Contractor shall keep at the site at all times. The following information shall be inserted and dimensioned on said drawings and specifications, in RED by the Contractor: The exact location of all installations in their finished condition, including all electrical installations; all changes in construction, materials and installed equipment;

adequate dimensional data, both horizontal and vertical, to allow location of covered installations; the identification of changes authorized by change order, and the number of that change order. This set of working plans shall be reviewed with the RPR once a month during review of work accomplished to date for use in preparation of the monthly progress payment. Upon completion of the work, said drawings and specifications shall be returned to the Owner prior to the final payment.

Drawings shall be subject to the inspection of the RPR at all times and shall be kept current weekly with all work instructions, change orders, and construction adjustments shown thereon and initialed by the Inspector.

Progress payments or portions thereof may be withheld if drawings are not maintained as stated above. At the final inspection, the contractor shall submit record drawings to the RPR for review and comment. The work will not be formally accepted until the record drawings are accepted by the RPR.

Prior to release of retainage by the Owner, the Contractor shall deliver to the RPR the Contractor's set of marked -up drawings as identified above for the RPR's use in preparing the project record drawings.

(26) OPERATION AND MAINTENANCE MANUALS

For use in subsequent maintenance and operations, the Contractor shall furnish five (5) bound and indexed copies of maintenance and operation information supplied by the manufacturer covering all equipment and systems included in the contract. The submittal shall include, but not be limited to:

- Approved Equipment Submitted for the Project
- Drawings
- Illustrations
- Parts Lists
- Wiring Diagrams of Systems
- Internal Wiring Diagrams and Circuit Board Schematics and Layout Drawings
- Manufacturer's Recommended Spare Parts List
- Name, Address and Phone Number of Nearest Parts and Service Agency
- Systems Balance Data
- Maintenance and Service Instructions, Including Recommended Lubrication
- Operation Instructions
- Software, Including Annotated Source Lists and Programs

This submittal is required for all mechanical, electrical, instrumentation, control, communications, sound, control or special equipment and systems. The Contractor shall submit the required data for review at least thirty (30) days prior to the final inspection date. Corrections, additions, and/or resubmittal of data shall be made as directed by the RPR.

The RPR, and other persons as he may designate, shall receive complete maintenance and operating instructions for all items included above prior to final inspection of the project.

(27) ANTI-TRUST ASSIGNMENT

By execution of the Contract Documents, or any subcontract awarded by the Contractor, the Contractor or any subcontractor offers and agrees to assign and hereby does assign to the Town all rights, title, and interest in and to all causes of action such Contractor or subcontractor may have under Section 4 of the Clayton Act (15 USC Section 15) or under the Cartright Act (Chapter 2 of Part 2 of Division 7 of the Business and Professions Code, commencing with Section 16700), arising from purchases of goods, services, or materials pursuant to this public works contract or subcontract. This assignment shall be made and shall become effective upon execution of the contract.

(28) CONTRACTOR NOT AGENT, NOR EMPLOYEE

Neither the Contractor nor any subcontractor, or any officer, agent, or employee of either, is, nor shall they represent themselves to be, an officer, agent, or employee of the Town for any purpose whatsoever.

No person employed by the Contractor, or by any subcontractors, is, nor shall they be construed to be, in any manner or for any purpose whatsoever, employees of the Town.

(29) CONTRACTOR'S GUARANTEE

The Owner shall not, in any way or manner, be answerable or suffer loss, damage, expense or liability for any loss or damage that may happen to any building, work or equipment or any part thereof, or in, on, or about the same during its construction and before acceptance. Contractor unqualifiedly guarantees the first-class quality of all workmanship and of all materials, apparatus and equipment used or installed by him or by any subcontractor or supplier in the project which is the subject of this Contract, unless a lesser quality is expressly authorized in the Plans and Specifications, in which event Contractor shall conform with the Plans and Specifications or any written authorized deviation therefrom. In case of any defect in work, materials, apparatus or equipment, whether latent or patent, revealed to Owner within one (1) year of the date of acceptance of completion of this Contract by the Owner, the Contractor shall forthwith remedy such defect or defects without cost to the Owner.

(30) EXISTING CONDITIONS.

Test borings and tests pits have been excavated throughout the site and the results of these tests are available for inspection. These borings show the conditions prior to the start of any construction on the Airport property. The Owner assumes no responsibility for the accuracy of the data presented. The Contractor shall be responsible for obtaining and verifying any and all soils and subsoil data required to prepare his/her bid.

The Contractor shall be fully responsible for handling any water or water-related problems that may arise during the construction of this project without additional compensation over and above that provided for in the unit prices bid.

(31) COORDINATION MEETING

In order to coordinate the work, a weekly meeting will be held in the Airport Manager's Office, Mammoth Yosemite Airport.

The time of this meeting will be determined at a time convenient to the Owner, RPR and Contractor. The Contractor's superintendent must attend these meetings.

At this weekly meeting the Contractor shall submit in writing an updated progress report for the total work and a schedule defining the work for the following week. Except for emergencies or unforeseen circumstances, this schedule shall be followed.

(32) TESTING AND ACCEPTANCE OF MATERIALS

All materials in which quality of the product such as gradation, Atterberg Limits, sand equivalent, CBR, etc., is specified, shall meet those specifications when in the final as-compacted condition and not the condition at the stockpile or source of supply. Any deviation from these requirements shall be corrected by removal and replacement with materials that conform to the specifications. When the materials removed are screened and/or blended and reincorporated in the work, the materials as placed shall meet all specification requirements. It shall be the Contractor's responsibility to coordinate his materials, production and construction procedures so that the final compacted product is acceptable.

(33) DETERMINATION OF IN-PLACE DENSITY

Where the determination of in-place dry density for soil or aggregate materials is required, the Owner may determine the in-place density by the use of Nuclear Testing equipment or sand volume equipment. This testing for in-place density shall conform to ASTM Designation D 1556, "Test for Density of Soil In Place by the Sand Cone Method" or ASTM D 6938, "In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)," using Procedure A, the direct transmission method, and ASTM D 6938 shall be used to determine the moisture content of the material.

In case of dispute in determination of the in-place dry density, the dry density as determined in accordance with ASTM Designation D 1556, "Test for Density of Soil In Place by the Sand Cone Method," shall govern.

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**TOWN OF MAMMOTH LAKES
MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING - PHASE 2**

SPECIAL PROVISIONS

**PART IV - TECHNICAL PROVISIONS
ADVISORY CIRCULAR 150/5370-10H**

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Item P-151 Clearing and Grubbing

DESCRIPTION

151-1.1 This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Resident Project Representative (RPR).

a. Clearing – shall consist of the cutting and removal of all fences and other loose or projecting material from the designated areas.

b. Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the RPR is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.

c. Tree Removal – Not applicable.

CONSTRUCTION METHODS

151-2.1 General. The areas denoted on the plans to be cleared and cleared and grubbed shall be staked on the ground by the Contractor as indicated on the plans .

The removal of existing structures and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the RPR who will notify the proper local authority or owner to secure prompt action.

151-2.1.1 Disposal. All materials removed by clearing or by clearing and grubbing shall be disposed of outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the RPR. As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case, shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the RPR and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the RPR permission in writing from the property owner for the use of private property for this purpose.

151-2.1.2 Blasting. Blasting shall not be allowed.

151-2.2 Clearing. The Contractor shall clear the staked or indicated area of all materials as indicated on the plans.

Fences shall be removed and disposed of off airport property.

151-2.3 Clearing and grubbing. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials as indicated on the plans, shall be removed, except where embankments exceeding 3-1/2 feet in depth will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap roots and

other projections over 1-1/2 inches in diameter shall be grubbed out to a depth of at least 18 inches below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes in embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

METHOD OF MEASUREMENT

151-3.1 The quantities of clearing as shown by the limits on the plans shall be per lump sum of fencing specifically cleared.

151-3.2 The quantities of clearing and grubbing as shown by the limits on the plans shall be the number of acres or fractions thereof of land specifically cleared and grubbed.

BASIS OF PAYMENT

151-4.1 Payment shall be made at the contract unit price per lump sum for clearing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

151-4.2 Payment shall be made at the contract unit price per acre for clearing and grubbing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-151-4.1	Clearing, Fence Removal / Demolition – per lump sum
Item P-151-4.2	Clearing and grubbing - per acre or fractions thereof

END OF ITEM P-151

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 which is not otherwise classified and paid for under one of the following items.

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 (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) 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.

Volumetric quantities were calculated using design cross sections which were created for this project using the DTM files of the applicable design surfaces and generating End Area Volume Reports. Paper copies of design cross sections 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 (30 mm) of the stated elevations for ground surfaces, or within 0.04 foot (12 mm) 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 (300 mm) 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 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. Not applicable.

152-2.3 Borrow excavation. Borrow areas within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the RPR. All unsuitable material shall be disposed of by the Contractor as shown on the plans. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

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, the top 6 inches of subgrade shall be compacted to not less than 95% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils 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.

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 (150 mm) 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 (300 mm) 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 (150 mm) nor more than 12 inches (300 mm) 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 $\pm 2\%$ 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 D 1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the contractor for every 500 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 (19.0 mm) 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 95% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 6" and to a density of not less than 95 percent of the maximum density 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.

The in-place field density shall be determined in accordance with ASTM D1556 or 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-compact 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 (100 mm) in their greatest dimensions will not be allowed in the top 12 inches (300 mm) 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 (60 cm) 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 (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items.

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. After compaction is completed, the subgrade area shall be proof rolled with a fully loaded water truck 20 ton in the presence of the RPR. Apply a minimum of 3 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 (25 mm) or show permanent deformation greater than 1 inch (25 mm) 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 a depth of 6 inches and to a density of not less than 95 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 6 inches and to a density of not less than 90 percent of the maximum density as determined by ASTM D698.

The material to be compacted shall be within $\pm 2\%$ 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 $\frac{3}{4}$ inch (19.0 mm) sieve, follow the methods in ASTM D1557. Tests for moisture content and compaction will be taken at a minimum of 500 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 D1556 or 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 (75 mm), 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 $\pm \frac{1}{2}$ inch (12 mm) when tested with a 12-foot (3.7-m) 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 (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within ± 0.05 feet (15 mm) of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to be placed, grade shall not vary more than 0.10 feet (30 mm) 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 applicable.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard shall be computed by the average end areas of design cross sections. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

152-3.2 The quantity of unclassified excavation to be paid for shall be the number of cubic 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.

152-3.3 The quantity of scarify and recompact subgrade shall be the number of square yards of subgrade scarified and recompact.

BASIS OF PAYMENT

152-4.1 Unclassified excavation payment shall be made at the contract unit price per cubic 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 scarify and recompact subgrade, payment shall be made at the contract unit price per square yard of subgrade scarified and recompact. This price shall be full compensation for furnishing all materials, labor, equipment, tool, water, and incidentals necessary to complete this item.

Payment will be made under:

Item P-152-4.1	Unclassified Excavation - per cubic yard
Item P-152-4.2	Scarify and Recompact Subgrade – 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
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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
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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
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Item P-154 Subbase Course

DESCRIPTION

154-1.1 This item shall consist of a subbase course composed of granular materials constructed on a prepared subgrade or underlying course in accordance with these specifications, and in conformity with the dimensions and typical cross-section shown on the plans.

MATERIALS

154-2.1 Materials. The subbase material shall consist of hard durable particles or fragments of granular aggregates and/or recycled asphalt pavement (RAP). The material may be obtained from gravel pits, stockpiles, or may be produced from a crushing and screening plant with proper blending. The materials from these sources shall meet the requirements for gradation, quality, and consistency. The material shall be free from vegetative matter, excessive amounts of clay, and other objectionable substances; uniformly blended; and be capable of being compacted into a dense, stable subbase.

The subbase material shall exhibit a California Bearing Ratio (CBR) value of at least 35 when tested in accordance with ASTM D1883. The subbase material shall meet the gradation specified in the table below.

Subbase Gradation Requirements

Sieve designation	Percentage by weight passing sieves		Contractor's Final Gradation	Job Control Grading Band Tolerances ¹ (Percent)
	Subbase Aggregate	Recycled pavement (RAP or RCO)		
3 inch (75 mm)	100			0
1 1/2 inch (37.5 mm)		100		0
3/4 inch (19.0 mm)	70-100	70-100		±10
No. 10 (2.00 mm)	20-100	20-100		±10
No. 40 (425 µm)	5-60	5-60		±5
No. 200 (75 µm)	0-5	0-5		±5
No. 635 0.02mm	0-3	0-3		±0

¹The "Job Control Grading Band Tolerances" shall be applied to "Contractor's Final Gradation" to establish the job control grading band.

The portion of the material passing the No. 40 (425 µm) sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than six (6) when tested in accordance with ASTM D4318.

The material finer than 0.02 mm shall be limited to a maximum of 3% (0 grading band tolerances). Testing per AASHTO T88 will be required for the percentage passing the 0.02 mm particle size once per lot.

154-2.2 Sampling and testing.

a. Aggregate base materials. Samples shall be taken by the Contractor per ASTM D75 for initial aggregate subbase requirements and gradation. Material shall meet the requirements in paragraphs 154-2.1. The Contractor shall submit to the Resident Project Representative (RPR) certified test results showing that the aggregate meets the Material requirements of this section. Tests shall be representative of the material to be used for the project.

b. Gradation requirements. The Contractor shall take at least one aggregate subbase sample per day in the presence of the RPR to check the final gradation. Samples shall be taken from the in-place, un-compacted material at sampling locations determined by the RPR on a random basis per ASTM D3665. Sampling shall be per ASTM D75 and tested per ASTM C136 and ASTM C117. Results shall be furnished to the RPR by the Contractor each day during construction. Material shall meet the requirements in paragraph 154-2.1.

154-2.3 Separation Geotextile. Not used.

CONSTRUCTION METHODS

154-3.1 General. The subbase course shall be placed where designated on the plans or as directed by the RPR. The material shall be shaped and thoroughly compacted within the tolerances specified.

Granular subbases which, due to grain sizes or shapes, are not sufficiently stable to support the construction equipment without movement, shall be mechanically modified to the depth necessary to provide stability as directed by the RPR. The mechanical modification shall include the addition of a fine-grained medium to bind the particles of the subbase material sufficiently to furnish a bearing strength, so the course will not deform under construction equipment traffic.

154-3.2 Preparing underlying course. Prior to constructing the subbase course, clean the underlying course or subgrade of all foreign substances. The surface of the underlying course or subgrade shall meet specified compaction and surface tolerances in accordance with Item P-152. Correct ruts, soft yielding spots in the underlying courses, and subgrade areas having inadequate compaction and/or deviations of the surface from the specified requirements, by loosening and removing soft or unsatisfactory material, adding approved material, reshaping to line and grade, and recompacting to specified density requirements. For cohesionless underlying courses or subgrades containing sands or gravels, as defined in ASTM D2487, the surface shall be stabilized prior to placement of the overlying course by mixing the overlying course material into the underlying course, and compacting by approved methods. The stabilized material shall be considered as part of the underlying course and shall meet all requirements for the underlying course. The finished underlying course shall not be disturbed by traffic or other operations and shall be maintained in a satisfactory condition until the overlying course is placed. The underlying course shall be checked and accepted by the RPR before placing and spreading operations are started.

To protect the subgrade and to ensure proper drainage, spreading of the subbase shall begin along the centerline of the pavement on a crowned section or on the high side of pavements with a one-way slope.

154-3.3 Control Strip. The first half-day of subbase construction 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 (300 mm) 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.

154-3.4 Placement. The material shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted. The material shall not be placed when the underlying course is soft or yielding.

The material shall meet gradation and moisture requirements prior to compaction. Material may be free-draining and the minimum moisture content shall be established for placement and compaction of the material.

The material shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 12 inches (300 mm) 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.

154-3.5 Compaction. The subbase material shall be compacted, adjusting moisture as necessary, to be within $\pm 2\%$ of optimum moisture. The field density of the compacted material shall be at least 98% of the maximum density as specified in paragraph 154-3.9a. If the specified density is not attained, the area of the lift represented by the test shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

154-3.6 Weather limitation. Material shall not be placed unless the ambient air temperature is at least 40°F (4°C) and rising. Work on subbase course shall not be conducted when the subgrade is wet or frozen or the subbase material contains frozen material.

154-3.7 Maintenance. No base or surface course shall be placed on the subbase until the subbase has been accepted by the RPR. The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, the Contractor shall verify that materials still meet all specification requirements before placement of additional material. Equipment may be routed over completed sections of subbase course, provided the equipment does not damage the subbase course and the equipment is routed over the full width of the completed subbase course. Any damage to the subbase course from routing equipment over the subbase course shall be repaired by the Contractor at their expense.

154-3.8 Surface tolerance. 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 (75 mm), 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 $\pm \frac{1}{2}$ inch (12 mm) when tested with a 12-foot (3.7-m) 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 (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/-0.05 feet (15 mm) of the specified grade.

154-3.9 Acceptance sampling and testing. The aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1000 square yards. Sampling locations will be determined on a random basis per ASTM D3665.

a. Density. 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.

Each area shall be accepted for density when the field density is at least 98% of the maximum density of laboratory specimens compacted and tested per ASTM D1557. The in-place field density shall be determined per ASTM D1556 or 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. If the specified density is not attained, the area represented by the failed test shall be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, use methods in ASTM D1557 and the procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles.

b. Thickness. The thickness of the base course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch (12 mm), the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches (75 mm), adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

154-4.1 Subbase course shall be measured by the number of cubic yards of subbase course material placed and compacted to specified density and plan thickness requirements in the completed course. The quantity of subbase course material shall be measured in final position based upon contractor's survey in the presence of the RPR of the completed work computed from elevations to the nearest 0.01 foot. On individual depth measurements, thicknesses more than 1/2 inch in excess of that shown on the plans shall be considered as the specified thickness plus 1/2 inch in computing the yardage for payment. Subbase materials shall not be included in any other excavation quantities.

BASIS OF PAYMENT

154-5.1 Payment shall be made at the contract unit price per cubic yard for subbase course. This price shall be full compensation for furnishing all materials; for all preparation, hauling, and placing of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-154-5.1	Imported Subbase Course - per cubic yard
Item P-154-5.2	Subbase Course from Stockpile – per cubic 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.

ASTM International (ASTM)

ASTM C117	Standard Test Method for Materials Finer than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
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 (2,700 kN-m/m ³))
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D4759	Practice for Determining the Specification Conformance of Geosynthetics
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

American Association of State Highway and Transportation Officials (AASHTO)

M 288	Geotextile Specification for Highway Applications
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Item P-209 Crushed Aggregate Base Course

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregate base constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross-sections shown on the plans.

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone or crushed gravel, and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 (4.75 mm) sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone or gravel, that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face ¹	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles ²	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

The Aggregate Base Course shall have a California Bearing Ratio (CBR) value of at least 100 at 0.1 inch to 0.5 inch penetration inclusive at 100% of maximum dry density as determined by ASTM D1557, Method D when tested in accordance with ASTM D1883.

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances ¹ (Percent)
2 inch (50 mm)	100		0
1-1/2 inch (37.5 mm)	95-100		±5
1 inch (25.0 mm)	70-95		±8
3/4 inch (19.0 mm)	70-85		±8
No. 4 (4.75 mm)	30-60		±8
No. 40 ² (425 µm)	10-30		±5
No. 200 ² (75 µm)	0-4		±3
No. 635 0.02 mm	0-2		±0

¹ The "Job Control Grading Band Tolerances for Contractor's Final Gradation" in the table shall be applied to "Contractor's Final Gradation" to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

² The fraction of material passing the No 200 (75 µm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 µm) sieve.

The material finer than 0.02 mm shall be limited to a maximum of 2%(0 grading band tolerances). Testing per AASHTO T88 will be required for the percentage passing the 0.02 mm particle size once per lot.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be

per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 Separation Geotextile. Not used.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the 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 (300 mm) 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 continue 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 by the RPR.

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 8 inches (300 mm) 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 at the Contractor's expense.

209-3.5 Compaction. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the base material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the

material during placing operations shall be within ± 2 percentage points of the optimum moisture content as determined by ASTM D1557. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

209-3.6 Weather limitations. Material shall not be placed unless the ambient air temperature is at least 40°F (4°C) and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

209-3.7 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 Surface tolerances. After the course has been compacted, 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 recompact to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

a. Smoothness. The finished surface shall not vary more than 3/8-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 25-foot grid.

b. Grade. The grade and crown shall be measured on a 25-foot grid and shall be within +0 and -1/2 inch (12 mm) of the specified grade.

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1000 square yds. Sampling locations will be determined on a random basis per ASTM D3665

a. Density. 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.

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D 1557. The in-place field density shall be determined per ASTM D1556 or 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. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompact and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

When the material has greater than 30 percent retained on the 3/4 inch sieve, use methods in ASTM D1557 and the procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles.

b. Thickness. Depth tests shall be made by test holes at least 3 inches in diameter that extend through the base. The thickness of the base course shall be within +0 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by

scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompact to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of cubic yards of material actually constructed and accepted by the RPR as complying with the plans and specifications. The quantity of Aggregate Base Course material shall be measured in final position based upon contractor's survey in the presence of the RPR of the completed work computed from elevations to the nearest 0.01 foot. Base materials shall not be included in any other excavation quantities.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per cubic yard for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-209-5.1	Crushed Aggregate Base Course - per cubic yard
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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 C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
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 D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis
American Association of State Highway and Transportation Officials (AASHTO)	
M288	Standard Specification for Geosynthetic Specification for Highway Applications

END OF ITEM P-209

Item P-401 Asphalt Mix Pavement

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. Slag shall not be used unless it is shown to be non-expansive when submerged in water. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 sieve. Fine aggregate is the material passing the No. 4 sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Percentage of Fractured Particles	Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face ¹	ASTM D5821
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 ²	ASTM D4791
Bulk density of slag ³	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29.

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

³ Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other

objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	10% maximum by weight of total aggregate	ASTM D1073

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade PG 70-28M or PG 70-28PM or PG 76-28 M or PG 76-28 PM.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard
Elastic Recovery	75% minimum	ASTM D6084 ¹

¹ Follow procedure B on RTFO aged binder.]

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods

required for developing the JMF; and be listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Resident Project Representative (RPR) prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the RPR for review and accepted in writing. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. 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 using a gyratory compactor in accordance with ASTM D6925.

Should a change in sources of materials be made, a new JMF must be submitted to the RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the RPR, will be borne by the Contractor.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of blows or gyrations
- Laboratory mixing and compaction temperatures.

- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of blows or gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR) ¹	not less than 75 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA) ^{2,3]}	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature
Hamburg Wheel Test ³	Less than 10mm @ 20,000 passes @50°C	AASHTO T324

¹ Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

² AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

³ Where APA not available , use Hamburg Wheel test (AASHTO T-324) 10mm @ 20,000 passes at 50°C.

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve
1 inch (25.0 mm)	100
3/4 inch (19.0 mm)	90-100
1/2 inch (12.5 mm)	74-86
3/8 inch (9.5 mm)	63-75
No. 4 (4.75 mm)	41-55
No. 8 (2.36 mm)	30-38
No. 16 (1.18 mm)	18-26
No. 30 (600 µm)	12-18
No. 50 (300 µm)	8-14
No. 100 (150 µm)	6-11
No. 200 (75 µm)	3-6
Minimum Voids in Mineral Aggregate (VMA)¹	14.0
Asphalt Percent:	
Stone or gravel	4.5-7.0
Slag	N/A

¹To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

401-3.4 Reclaimed asphalt pavement (RAP) RAP shall not be used.

401-3.5 Control Strip. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the RPR. The Contractor shall prepare and place a quantity of asphalt according to the JMF. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor quality control program (CQCP), showing conformance with the requirements of paragraph 401-5.1, has been accepted, in writing, by the RPR.

The control strip will consist of at least 250 tons (227 metric tons) or 1/2 subplot, whichever is greater. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with paragraph 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to less than 160°F (71°C). The equipment used in construction of the control strip shall be the same type, configuration and weight to be used on the project.

The control strip will be considered acceptable by the RPR if the gradation, asphalt content, and VMA are within the action limits specified in paragraph 401-5.5a; and Mat density greater than or equal to 94.5%, air voids 3.5% +/- 1%, and joint density greater than or equal to 92.5%.

If the control strip is unacceptable, necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense.

The control strip will be considered one lot for payment based upon the average of a minimum of 3 samples (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 401-8.1 using a lot pay factor equal to 100.

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the RPR, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The RPR, or RPR's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the RPR determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles are not required.

401-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the RPR upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A prime coat in accordance with Item P-602 shall be applied to aggregate base prior to placing the asphalt mixture.

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

401-4.12 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the RPR.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2d before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 10 feet except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m). On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The RPR may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot

mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 Joints. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C); or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooving is not required.

401-4.16 Diamond grinding. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

401-4.17 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the RPR prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The Contractor shall provide laboratory facilities and equipment for the RPR to perform QA testing in the QC laboratory with the RPR's personnel. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

a. Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues.

The Contractor may use a 12-foot (3.7 m) "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement

surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically. The documentation will be provided by the Contractor to the RPR by the end of the following working day.

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. Grinding shall be in accordance with paragraph 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus 1/2 inch and replacing with new material. Skin patching is not allowed.

401-5.4 Sampling. When directed by the RPR, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 µm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

b. Range. Control charts shall be established to control gradation process variability. The range shall be plotted as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of $n = 2$. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for $n = 3$ and by 1.27 for $n = 4$.

Control Chart Limits Based on Range

Sieve	Suspension Limit
1/2 inch (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 µm)	6%
No. 200 (75 µm)	3.5%
Asphalt Content	0.8%

c. Corrective Action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

- (1) One point falls outside the Suspension Limit line for individual measurements or range; or
- (2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a subplot basis.

(1) Sampling. Material from each subplot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each subplot in accordance with ASTM D3203 for a set of three compacted specimens prepared in accordance with ASTM D6926.

d. In-place asphalt mat and joint density. Each subplot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch (125 mm) diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each subplot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or subplot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each subplot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each subplot sample by the TMD for that subplot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each subplot that has a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, and grade.

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch (12 mm) vertically.

Cross-sections of the pavement shall be taken at a minimum 25-foot longitudinal spacing, at all longitudinal grade breaks, and at start and end of each lane placed. Minimum cross-section grade points shall include grade at centerline, $\pm 25'$ grid, and edge of pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the subplot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. Not used.

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Table 5. Acceptance Limits for Air Voids and Density

Test Property	Pavements Specification Tolerance Limits	
	L	U
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Joint density (%)	90.5	--

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.30; Base Course Mat Density (%), 1.55; Joint Density (%), 1.55.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94.5% with 1.30% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 94.0% with 1.55% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 92.5% with 1.55% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed 106 percent of the product of the contract unit price and the total number of tons of asphalt used in the accepted work.

b. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the subplot shall be reduced by 5%.

Table 6. Price adjustment schedule¹

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject ²

¹ Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

² The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness. Not used.

401-8.1 Payment.

Payment will be made under:

Item P-401-8.1 Asphalt Surface Course - per ton

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 C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures

ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
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
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Durometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyrotory Compactor.
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)

ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Standard Test Method for Using a Rolling Inclinator to Measure Longitudinal and Transverse Profiles of a Traveled Surface
American Association of State Highway and Transportation Officials (AASHTO)	
AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)
Asphalt Institute (AI)	
Asphalt Institute Handbook MS-26, Asphalt Binder	
Asphalt Institute MS-2 Mix Design Manual, 7th Edition	
AI State Binder Specification Database	
Federal Highway Administration (FHWA)	
Long Term Pavement Performance Binder Program	
Advisory Circulars (AC)	
AC 150/5320-6	Airport Pavement Design and Evaluation
FAA Orders	
5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards
Software	
FAARFIELD	

END OF ITEM P-401

Item P-602 Emulsified Asphalt Prime Coat

DESCRIPTION

602-1.1 This item shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 Emulsified Asphalt material. The emulsified asphalt material shall be as specified in ASTM D3628 for use as a prime coat appropriate to local conditions. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt material. The COA shall be provided to and approved by the Resident Project Representative (RPR) before the emulsified asphalt material is applied. The furnishing of the COA for the emulsified 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

602-3.1 Weather limitations. The emulsified asphalt prime coat shall be applied only when the existing surface is dry; the atmospheric temperature is 50°F (10°C) or above, and the temperature has not been below 35°F (2°C) 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.

602-3.2 Equipment. The equipment shall include a self-powered pressure asphalt material distributor and equipment for heating asphalt material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi (4.5 kg/sq cm) of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the asphalt material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 1.0 gallons per square yard (0.23 to 4.5 L/square meter), with a pressure range of 25 to 75 psi (172.4 to 517.1 kPa) and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying asphalt material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the asphalt material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

A power broom and power blower suitable for cleaning the surfaces to which the asphalt coat is to be applied shall be provided.

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.

602-3.3 Application of emulsified asphalt material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The asphalt emulsion material shall be uniformly applied with an asphalt distributor at the rate of 0.15 to 0.30 gallons per square yard (0.68 to 1.36 liters per square meter) depending on the base course surface texture. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Following application of the emulsified asphalt material and prior to application of the succeeding layer of pavement, allow the asphalt coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas. Allow the prime coat to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course. Furnish and spread sand to effectively blot up and cure excess asphalt material. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner. Keep traffic off surfaces freshly treated with asphalt material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

602-3.4 Trial application rates. The Contractor shall apply a minimum of three lengths of at least 100 feet (30 m) for the full width of the distributor bar to evaluate the amount of emulsified asphalt material that can be satisfactorily applied with the equipment. Apply three different application rates of emulsified asphalt materials within the application range specified in paragraph 602-3.3. Other trial applications can be made using various amounts of material as directed by the RPR. The trial application is to demonstrate the equipment can uniformly apply the emulsified asphalt material within the rates specified and determine the application rate for the project.

602-3.5 Freight and waybills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate 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

602-4.1 The emulsified asphalt material for prime coat shall be measured by the ton. Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D4311. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

602-5.1 Payment shall be made at the contract unit price per ton for emulsified asphalt prime coat. This price shall be full compensation for furnishing all materials and for all preparation, delivering, and applying the materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item P-602-5.1	Emulsified Asphalt Prime Coat - per ton
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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 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 OF ITEM P-602

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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 (10°C) or above; the temperature has not been below 35°F (2°C) 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 (13 km per hour) or seven (700) feet per minute (213 m 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 (3.7-m) 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 (L/square meter)	Emulsion Application Bar Rate, gal/SY (L/square meter)
New asphalt	0.02-0.05 (0.09-0.23)	0.03-0.07 (0.13-0.32)
Existing asphalt	0.04-0.07 (0.18-0.32)	0.06-0.11 (0.27-0.50)
Milled Surface	0.04-0.08 (0.18-0.36)	0.06-0.12 (0.27-0.54)
Concrete	0.03-0.05 (0.13-0.23)	0.05-0.08 (0.23-0.36)

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 The emulsified asphalt material for tack coat shall be measured by the ton. Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D1250. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per ton of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-5.1	Emulsified Asphalt Tack Coat - per ton
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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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Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of:

ASTM D5893 Standard Specifications for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

as designated on the plans.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be $25\% \pm 5\%$ larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. Not used.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work including descriptive data, seven (7) days prior to use on the project.

a. **Tractor-mounted routing tool.** Not applicable.

b. **Concrete saw.** Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. **Sandblasting equipment.** Not applicable

e. **Waterblasting equipment.** The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with

paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

e. **Hand tools.** Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

f. **Hot-poured sealing equipment.** The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

g. **Cold-applied, single-component sealing equipment.** The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. Maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 Preparation of joints. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. **Sawing.** All joints shall be sawed, if necessary, in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. **Sealing.** Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old, loose sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by heat lance, tractor-mounted routing equipment, concrete saw, or waterblaster, as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch from the joint edge shall be sandblasted clean. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches from it. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. **Backer Rod.** When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. **Bond-breaking tape.** Not applicable

605-3.4 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet ahead of the joint sealing operations, perform a final cleaning with compressed air.

Fill the joints from the bottom up to 1/8 inch below the top of the concrete surface or level with the top of concrete surface as shown on the plans. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case must gravity methods or pouring pots be used to install the sealant material. Traffic must not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 Joint sealing material shall be considered incidental, and no separate measurement shall be made.

BASIS OF PAYMENT

605-5.1 Joint sealing materials shall be considered incidental, and no separate payment shall be made. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-605-5.1	Joint Sealing Filler, incidental to other work items
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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 D789	Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D5893	Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
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END ITEM P-605

Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20%, the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet FAA P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 inch (25 mm)	57
¾ inch (19 mm)	67

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Not used.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of ASTM C150 Type I or II.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 13% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 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.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1751 or D1752.

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing shall consist of reinforcing steel conforming to the requirements of ASTM A615. Steel for tie down anchor rods shall be galvanized conforming to ASTM A36.

610-2.11 Materials for curing concrete. Curing materials shall conform to ASTM C309 for White-Pigmented Liquid Membrane-Forming Compound, Type 2, Class B.

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The concrete shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

- a) The air content of the concrete used for the building floor slab with hard trowel finish shall be less than 2% as determined by ASTM C231
- b) The air content of the concrete used for all applications other than the floor slab shall be 5% +/- 1.2% as determined by ASTM C231

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

The building finished floor shall be a steel trowel finish using finishing machines or steel trowels, trowel surfaces to produce a dense, hard, smooth steel trowel finish. Commence troweling in one pass just sufficiently to flatten floated surface. Wait until concrete has set sufficiently; then resume steel troweling; continue and repeat as required to obtain a hard steel trowel finish, free of blemishes, ripples, and trowel marks. Do no:

1. Use cement or sand dusting to absorb or otherwise remove surface water.
2. Commence troweling too soon on freshly placed concrete.
3. Overwork surfaces by excessive troweling in an area in one pass.
4. Work out lips, uneven levels, and other irregularities prior to final troweling.
5. Neatly tool exposed edges, expansion joints, curbs, arises, and other details.
6. Surface across joints shall be level and free from offsets
7. Provide for interior surface not otherwise indicated or specified.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85°F (30 °C), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be considered incidental to all items unless specified herein and no separate measurement shall be made.

610-5.2 Bollards shall be the number of bollards installed complete.

BASIS OF PAYMENT

610-6.1 Concrete shall be considered incidental to all items unless specified herein and no separate payment shall be made.

610-6.2 Payment shall be made at the contract price by the number of the number of bollards installed.

These prices shall be full compensation for furnishing all materials including reinforcement and embedded items and for all preparation, delivery, installation, and curing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the items.

Payment will be made under:

Item P-610-6.1	Bollards – per each
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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 A36	Standard Specification for Carbon Structural Steel
ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars

ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
American Concrete Institute (ACI)	
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

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Item F-162 Chain-Link Fence

DESCRIPTION

162-1.1 This item shall consist of furnishing and erecting a chain-link fence in accordance with these specifications, the details shown on the plans, and in conformity with the lines and grades shown on the plans or established by the RPR.

MATERIALS

162-2.1 Fabric. The fabric shall be woven with a 9-gauge galvanized steel wire, polyvinylchloride (pvc) coated in a 2-inch mesh and shall meet the requirements of ASTM A 392, Class 2, and ASTM F668, Class 2b.

162-2.2 Barbed wire. Barbed wire shall be 2-strand 12-1/2 gauge zinc-coated wire with 4-point barbs and shall conform to the requirements of ASTM A 121, Class 3, Chain Link Fence Grade.

162-2.3 Posts, rails, and braces. Line posts, rails, and braces shall conform to the requirements of ASTM F1043 or ASTM F1083 as follows:

Galvanized tubular steel pipe shall conform to the requirements of Group IA, (Schedule 40) coatings conforming to Type A, or Group IC (High Strength Pipe), External coating Type B, and internal coating Type B or D.

Vinyl or polyester coated steel shall conform to the requirements of ASTM F1043, Paragraph 7.3, Optional Supplemental Color Coating.

The dimensions of the posts, rails, and braces shall be in accordance with Tables I through VI of Federal Specification RR-F-191/3.

162-2.4 Gates. Gate frames shall consist of galvanized steel pipe polymer-coated and shall conform to the specifications for the same material under paragraph 162-2.3. The fabric shall be of the same type material as used in the fence.

162-2.5 Wire ties and tension wires. Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A824.

All material shall conform to Federal Specification RR-F-191/4.

162-2.6 Miscellaneous fittings and hardware. Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A153.

162-2.7 Concrete. Concrete shall have a minimum 28-day compressive strength of 4000 psi and meet the requirements of P610.

162-2.8 Marking. Each roll of fabric shall carry a tag showing the kind of base metal (steel, aluminum, or aluminum alloy number), kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal (steel, aluminum, or aluminum alloy number), and kind of coating.

CONSTRUCTION METHODS

162-3.0 Grading fence line. The Contractor shall grade the fence line to remove any abrupt changes in elevation. Grading shall provide an area at least 15 feet wide along the fence line, 5 feet outside the fence and 10 feet on the Airport side for the temporary access road. Grading shall be completed prior to placement of any post, fabric or other fence materials. In certain areas along the fence line it shall be necessary for the Contractor to fill or cut small areas to provide a uniform fence line. All irregularities, such as berms, spoil piles, or embankments that do not provide control of drainage or other necessary functions shall be leveled to match adjoining ground and provide a uniform surface and fence elevation.

Spoil piles of vegetation generated by clearing and grubbing and/or grading operations shall not be used in embankments. Vegetation shall be removed from the Airport property and disposed of offsite or mulched by approved methods and spread over the site after the new fence construction is completed.

The cost of grading the fence line and removing and disposing of the material shall not constitute a pay item and shall be considered incidental to fence construction.

162-3.1 General. The fence shall be constructed in accordance with the details on the plans and as specified here using new materials. All work shall be performed in a workmanlike manner satisfactory to the RPR. The Contractor shall layout the fence line based on the plans. The Contractor shall span the opening below the fence with barbed wire at all locations where it is not practical to conform the fence to the general contour of the ground surface because of natural or manmade features such as drainage ditches. The new fence shall be permanently tied to the terminals of existing fences as shown on the plans. The Contractor shall stake down the woven wire fence at several points between posts as shown on the plans.

The Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet (90 m). The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence.

162-3.2 Clearing fence line. Clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions that will interfere with proper construction of the fence. Stumps within the cleared area of the fence shall be grubbed or excavated. The bottom of the fence shall be placed a uniform distance above ground, as specified in the plans. When shown on the plans or as directed by the RPR, the existing fences which interfere with the new fence location shall be removed by the Contractor as a part of the construction work unless such removal is listed as a separate item in the bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other suitable material and compacted with tampers.

The cost of removing and disposing of the material shall not constitute a pay item and shall be considered incidental to fence construction.

162-3.3 Installing posts. All posts shall be set in concrete at the required dimension and depth and at the spacing shown on the plans.

The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within seven (7) days after the individual post footing is completed.

Should rock be encountered at a depth less than the planned footing depth, a hole 2 inches (50 mm) larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches (300 mm). After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement

and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required footing depth. No extra compensation shall be made for rock excavation.

162-3.4 Installing top rails. The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion.

162-3.5 Installing braces. Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.

162-3.6 Installing fabric. The wire fabric shall be firmly attached to the posts and braced as shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than one inch (25 mm) or more than 4 inches (100 mm) from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 inches (150 mm) or less.

162-3.6a Installing drainage swale crossing. Rows of barbed wire shall be stretched between two corner posts at 6-inch spacing on the drainage swale fence line crossings as shown on the plans to discourage deer and other animals from accessing the airport through the swale.

162-3.7 Electrical grounds. Electrical grounds shall be constructed at 500 feet intervals. The ground shall be installed directly below the point of crossing. The ground shall be accomplished with a copper clad rod 8 feet (2.4 m) long and a minimum of 5/8 inches (16 mm) in diameter driven vertically until the top is 6 inches (150 mm) below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded. Installation of ground rods shall not constitute a pay item and shall be considered incidental to fence construction. The Contractor shall comply with FAA-STD-019, Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment, paragraph 4.2.3.8, Lightning Protection for Fences and Gates, when fencing is adjacent to FAA facilities.

162-3.8 Cleaning up. The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction.

METHOD OF MEASUREMENT

162-4.1 Chain-link fence will be measured for payment by the linear foot. Measurement will be along the top of the fence from center to center of end posts, excluding the length occupied by gate openings.

BASIS OF PAYMENT

162-5.1 Payment for chain-link fence will be made at the contract unit price per linear foot (meter).

The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the items.

Payment will be made under:

Item F-162-5.1 Chain-Link Fence (PVC Coated) - 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.

ASTM International (ASTM)

ASTM A121	Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
ASTM A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A392	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A491	Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A824	Standard Specification for Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link Fence
ASTM B117	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM F668	Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and other Organic Polymer Coated Steel Chain-Link Fence Fabric
ASTM F1043	Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework
ASTM F1083	Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F1183	Standard Specification for Aluminum Alloy Chain Link Fence Fabric
ASTM F1345	Standard Specification for Zinc 5% Aluminum-Mischmetal Alloy Coated Steel Chain-Link Fence Fabric
ASTM G152	Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G153	Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
ASTM G155	Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials

Federal Specifications (FED SPEC)

FED SPEC RR-F-191/3	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
FED SPEC RR-F-191/4	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

FAA Standard

FAA-STD-019 Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements
for Facilities and Electronic Equipment

FAA Orders

5300.38 AIP Handbook

Security Cameras

Electronic Industries Association (EIA) Standards 170, 232, 250C and 485

Federal Communications Commission (FCC) Rules Part 15, Sub-part J – Equipment
Authorization Procedures

International Standards Organization (ISO) 9001 Quality Management Systems – Requirements

Military Standards (MIL-STD) 454 Standard General Requirements for Electronic Equipment
and 810E Method 509 Procedure 1 – exterior salt atmospheres

National Fire Protection Association (NFPA) 70 National Electric Code (NEC)

National Electrical Manufacturers Association (NEMA)

Institute of Electrical and Electronics Engineers (IEEE)

END OF ITEM F-162

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 M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
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701-2.3 Concrete. Concrete for pipe cradles shall have a minimum compressive strength of 2000 psi (13.8 MPa) at 28 days and conform to the requirements of ASTM C94.

701-2.4 Rubber gaskets. Rubber gaskets for PVC pipe, polyethylene, and polypropylene 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). Not used.

701-2.9 Precast box culverts. Manufactured in accordance with and conforming to ASTM C1433.

701-2.10 Precast concrete pipe. Not used.

701-2.11 Flared End Sections. Flared end sections shall be plastic as called for on the plans. Plastic end sections shall be standard end sections for the specified size pipe. Materials for end sections shall conform to the requirements of Caltrans Standard Specifications Section 70-5.02B(4).

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 (300 mm) 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 (200 mm) or 1/2 inch (12 mm) 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. Not used.

b. Flexible pipe. Not used.

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 rubber gaskets.

a. Concrete pipe. Not used.

b. Metal pipe. Not used.

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.

d. Fiberglass pipe. Not used.

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. Not used.

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. Not used.

701-3.5-2 Placement of Embedment Material

The embedment material shall be compacted in layers not exceeding 6 inches (150 mm) on each side of the pipe and shall be brought up one foot (30 cm) 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 (150 mm) and shall be brought up evenly on each side of the pipe to one foot (30 cm) 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 placed 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 in the presence of the RPR 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.

Flexible pipes shall be inspected for rips, tears, joint separations, soil migration, cracks, localized buckling, settlement, alignment, and deflection.

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. The 12-inch HDPE Storm Drain pipe shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

701-4.2. Not used.

701-4.3 Not used.

701-4.4 Not used.

701-4.5 Plastic flared end sections will be measured per each size installed.

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 12-inch HDPE Storm Drain pipe.

701-5.2 Not used.

701-5.3 Not used.

701-5.4 Not used.

701-5.5 Payment will be made at the contract unit price for each flared end section of the specified size and type complete in place.

Payment will be made under:

Item 701-5.1	12-inch HDPE Storm Drain - per linear foot
Item 701-5.2	Not used.
Item 701-5.3	Not used.
Item 701-5.4	Not used.
Item 701-5.5	12-inch HDPE Flared End Sections – 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.

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

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Item D-751 Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of an oil-water separator, 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.

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 (90 cm) nor more than 48 inches (120 cm). 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. – Not Used

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. Not used.

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 (300 mm).

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 (200 mm) 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.

751-3.11 Adjust existing structures to grade. Not applicable,

METHOD OF MEASUREMENT

751-4.1 The Oil-Water Separator shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of Oil-Water Separator 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-751-5.3	Combination Inlet/Oil-Water Separator – 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

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Item D-752 Concrete Culverts, Headwalls, and Miscellaneous Drainage Structures

DESCRIPTION

752-1.1 This item shall consist of miscellaneous drainage structures constructed 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.

MATERIALS

752-2.1 Concrete. Not applicable.

752-2.2 Rip Rap. The cobbles used for rip rap shall be hard, durable, and resistant to weathering, and shall meet gradation requirements. Neither breadth nor thickness of a single stone should be less than one-third its length.

Cobbles shall conform to the following requirements:

Apparent Specific Gravity (ASTM C 127)	2.5 Min.
Percent Absorption (ASTM C 127)	4.2 Max.
Durability Index (Calif. 229)	52 Min.

Rip rap shall conform to the following Caltrans Class I gradation:

Rock Gradation								
Nominal RSP class by median particle diameter ^b		Nominal median particle weight W ₅₀ ^{c,d}	d ₁₅ ^c (in)		d ₅₀ ^c (in)		d ₁₀₀ ^c (in)	Placement
Class ^a	Diameter (in)		Min	Max	Min	Max	Max	Method
I	6	20 lb	3.7	5.2	5.7	6.9	12.0	B

^bIntermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness.

^cd%, where % denotes the percentage of the total weight of the graded material.

^dValues shown are based on the minimum and maximum particle diameters shown and an average specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

Each load of rip rap shall be reasonably well graded from the smallest to the maximum size specified.

CONSTRUCTION METHODS

752-3.1 Unclassified excavation.

a. Trenches and foundation pits for structures or structure footings shall be excavated to the lines and grades and elevations shown on the plans. 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 approximate only; and the RPR may approve, in writing, changes in dimensions or elevations of footings necessary to secure 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. When rip rap 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 rip rap is placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to perform 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 excavation.

d. All bracing, sheathing, or shoring shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage the finished concrete. The cost of removal shall be included in the unit price bid for excavation.

e. After each excavation is completed, the Contractor shall notify the RPR. No rip rap shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

752-3.2 Backfilling. Not applicable.

752-3.3 Weep holes. Not applicable.

752-3.4 Cleaning and restoration of site. After the rip rap is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankment, 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.

752-3.5 Rip Rap. Slopes to be protected by rip rap shall be free of brush, trees, stumps and other organic material and be dressed to a smooth surface. All soft or spongy material shall be removed to the depth shown on the plans or as directed by the Engineer and replaced with approved material. A toe trench shall be dug when and as shown on the plans and maintained until the rip rap is placed.

Protection for structure foundations shall be provided as early as the foundation construction permits. The area to be protected shall be cleaned of waste materials and surfaces to be protected prepared as shown on the plans.

The rip rap shall be placed on prepared areas in a manner which will produce a reasonably well-graded, uniform mass of cobbles. The rip rap protection shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing underlying material. Placing of rip rap protection by methods likely to cause segregation will not be permitted.

The larger stones shall be well distributed, and the entire mass of stone shall conform approximately to the gradation specified. All rip rap shall be so placed and distributed that there will be no large accumulations of either the larger or smaller sizes of stone.

It is the intent of these specifications to produce a fairly compact rip rap protection in which all sizes of material are placed in their proper proportions. Hand placing or rearranging of individual stones by mechanical equipment may be required to the extent necessary to secure results specified.

Unless otherwise authorized by the Engineer, rip rap protection shall be placed in conjunction with construction of embankment with only sufficient lag in construction of the rip rap protection as may be necessary to allow for proper construction of the portion of the embankment protected and to prevent mixture of embankment and rip rap material. The Contractor shall maintain the rip rap protection until accepted, and any material displaced by any cause shall be replaced at no additional cost to the Owner.

METHOD OF MEASUREMENT

752-4.1 Not used

752-4.2 Not used

752-4.3 Not used

752-4.4 Not used

752-4.5 Rip rap will be measured by the number of tons furnished and installed.

BASIS OF PAYMENT

752-5.1 Not used.

752-5.2 Not used.

752-5.3 Not used.

752-5.4 Not used.

752-5.5 Payment will be made at the contract unit price per ton of rip rap furnished and installed.

These prices shall be full compensation for furnishing all materials and for all preparation, excavation, and placing the materials, and for all labor, equipment, tools, and incidentals necessary to complete the structure.

Payment will be made under:

Item D-752-5.5	Rip Rap – per ton
----------------	-------------------

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 D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/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

END OF ITEM D-752

**TOWN OF MAMMOTH LAKES
MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING - PHASE 2**

SPECIAL PROVISIONS

PART V -MULTIPURPOSE BUILDING PACKAGE PROVISIONS
CSI MasterFormat

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**SECTION 000101
PROJECT TITLE PAGE**

PROJECT MANUAL

FOR

MAMMOTH MULTI-PURPOSE STORAGE BUILDING

FEDERAL PROJECT - AIP NO. 3-06-0146-____-2026

CONTRACT AND BID DOCUMENTS

47 OLD MAMMOTH ROAD, SUITE R

POST OFFICE BOX 1609, MAMMOTH LAKES, CA 93546

(760) 965 3600

PUBLIC WORKS DEPARTMENT

DATE: 04/15/2026

PREPARED BY: M. NOVAK

NORR ASSOCIATES INC

END OF SECTION

**SECTION 000102
PROJECT INFORMATION**

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

- A. Project Name: Mammoth Multipurpose ARFF/SRE Building, located at: Mammoth Yosemite Airport.
1300 Airport Road.
Mammoth Lakes, California 93546.
- B. The Owner, hereinafter referred to as Owner: Town of Mammoth Lakes

1.02 PROJECT DESCRIPTION

- A. Summary Project Description:
- B. See plan package for simple pre-engineered metal storage building and applicable scope.

1.03 PROCUREMENT TIMETABLE

- A. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.04 PROCUREMENT DOCUMENTS

- A. Availability of Documents: Complete sets of procurement documents may be obtained:
 - 1. From Owner at the Project Manager's address listed above.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 000103
PROJECT DIRECTORY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Identification of project team members and their contact information.

1.02 OWNER:

- A. Name: Town of Mammoth Lake
- B. Primary Contact: All correspondence from the Contractor to the Architect will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Title: Project Manager.
 2. Name: Mike Novak

1.03 CONSULTANTS:

- A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Company Name: NORR Associates Inc.
 - a. Address Line 1: 2020 I St. Ste. 200.
 - b. City: Sacramento.
 - c. State: CA.
 - d. Zip Code: 95811.
 - e. Telephone: 916 453 3809.
 2. Primary Contact: .
 - a. Title: Architect of Record.
 - b. Name: Mike Novak.
 - c. Email: Mike.novak@norr.com.
- B. Civil Engineering Consultant:
1. Company Name: Kimley-Horn.
 - a. Address Line 1: 7900 Rancharra Parkway, Suite 100.
 - b. City: Reno.
 - c. State: NV.
 - d. Zip Code: 89511.
 - e. Telephone: 775 636 7834.
 2. Primary Contact:
 - a. Title: Civil Engineer.
 - b. Name: Heath Hildebrandt.
 - c. Email: Heath.Hildebrandt@kimley-horn.com.
- C. Civil Engineering Consultant:
1. Company Name: Brandley Engineering.
 - a. Address Line 1: 6125 King Rd. Ste. 201.
 - b. City: Loomis.
 - c. State: CA..
 - d. Zip Code: 95650.
 - e. Telephone: 916 652 4725.
- D. Structural Engineering Consultant:
1. Company Name: Bevier Structural Engineers, Inc..
 - a. Address Line 1: 2479 Sunrise Blvd..
 - b. City: Gold River.
 - c. State: CA.
 - d. Zip Code: 95827.

- e. Telephone: 916 631 3030.
- 2. Primary Contact:
 - a. Title: Structural Designer.
 - b. Name: Jon Wong.
 - c. Email: Jon@bevier.net.
- E. Mechanical Engineering Consultant - Plumbing and HVAC:
 - 1. Company Name: NORR Associates Inc.
 - a. Address Line 1: 2020 I St. Ste. 200.
 - b. City: Sacramento.
 - c. State: CA.
 - d. Zip Code: 95811.
 - e. Telephone: 916 453 3825.
 - 2. Primary Contact:
 - a. Title: Mechanical Engineer.
 - b. Name: Ben Sprinkle.
 - c. Email: Ben.Sprinkle@norr.com.
- F. Electrical Engineering Consultant:
 - 1. Company Name: NORR Associates Inc.
 - a. Address Line 1: 2020- I St., Ste 200.
 - b. City: Sacramento.
 - c. State: CA.
 - d. Zip Code: 95811.
 - e. Telephone: 916 453 3812.
 - 2. Primary Contact:
 - a. Title: Electrical Engineer.
 - b. Name: Joesph Gluvers.
 - c. Email: joseph.gluvers@norr.com.com.
- G. Fire Sprinkler Consultant:
 - 1. Company Name: Sacramento Engineering Consultants.
 - a. Address Line 1: 10555 Old Placerville Road.
 - b. City: Sacramento.
 - c. State: CA.
 - d. Zip Code: 95827.
 - e. Telephone: 916 368 4468.
 - 2. Primary Contact:
 - a. Title: Fire Engineer.
 - b. Name: Greg Godon.
 - c. Email: Greg@saceng.com.
- H. Fire Alarm Consultant:
 - 1. Company Name: NORR Associates Inc.
 - a. Address Line 1: 2020 I St. Ste. 200.
 - b. City: Sacramento.
 - c. State: CA.
 - d. Zip Code: 95811.
 - e. Telephone: 916 368 4468.
 - 2. Primary Contact:
 - a. Title: Electrical Engineer.
 - b. Name: Joesph Gluvers.
 - c. Email: joseph.gluvers@norr.com.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 000110
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PROCUREMENT AND CONTRACTING REQUIREMENTS

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- B. 012500 - Substitution Procedures
- C. 013000 - Administrative Requirements
- D. 013050 - Design Procedures and Substantiation Requirements
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- E. 014000 - Quality Requirements
- F. 016000 - Product Requirements
- G. 016116 - Volatile Organic Compound (VOC) Content Restrictions
- H. 017000 - Execution and Closeout Requirements
- I. 017419 - Construction Waste Management and Disposal
- J. 017800 - Closeout Submittals
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- A. For Site Preparation and Earthwork, Site Permit Package
- B. For Site Utilities, see Division 33

2.03 DIVISION 03 -- CONCRETE

- A. FAA P-610 - See Concrete Specification in upfront documents prior to technical specifications
- B. 031500 - Concrete accessories
- C. 032000 - Concrete Reinforcing
- D. 036000 - Grouting

2.04 DIVISION 05 -- METALS

For Pre-Engineered Metal Building Steel, See Division 13

- A. 054000 - Cold-Formed Metal Framing
- B. 055133 - Metal Ladders

2.05 DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

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- A. Envelope by Pre-Engineered Metal Building. See Division 13 and Metal Panel Sections Below for Minimum Requirements
- B. 071300 - Sheet Waterproofing - WR Meadows
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- D. 074213 - Metal Wall Panels

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- F. 077123 - Manufactured Gutters and Downspouts
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- H. 079200 - Joint Sealants

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- B. 083323 - Overhead Coiling Doors
- C. 083613 - Sectional Doors
- D. 087100 - Door Hardware
- E. 088000 - Glazing
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2.08 DIVISION 09 -- FINISHES

- A. 092216 - Non-Structural Metal Framing
- B. 099113 - Exterior Painting
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- B. 220529 - Hangers and Supports for Plumbing Piping and Equipment
- C. 220553 - Identification for Plumbing Piping and Equipment
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- D. 231126 - Facility Liquefied-Petroleum Gas Piping
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- F. 233416 - Centrifugal HVAC Fans
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- C. 260529 - Hangers and Supports for Electrical Systems
- D. 260533 - Raceways and Boxes for Electrical Systems
- E. 260543 - Underground Ducts and Raceways for Electrical Systems
- F. 260553 - Identification for Electrical Systems
- G. 260923 - Lighting Control Devices
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2.18 DIVISION 31 -- EARTHWORK

- A. FAA P-152 See Trenching Specification in upfront documents prior to technical specifications

2.19 DIVISION 32 -- EXTERIOR IMPROVEMENTS

2.20 DIVISION 33 -- UTILITIES

- A. 331416 - Potable Water Pipeline and Appurenances
- B. 33 3113 - Gravity Sewage

2.21 DIVISION 34 -- TRANSPORTATION

2.22 DIVISION 40 -- PROCESS INTEGRATION

2.23 DIVISION 46 -- WATER AND WASTEWATER EQUIPMENT

**SECTION 012300
ALTERNATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of Design-Build Engineering items
- B. Description of Alternates.

1.02 SCHEDULE OF DESIGN-BUILD ENGINEERING ITEMS

- A. Design-Build Items to be fully engineered by bidding contractor to meet the attached specifications and follow the information and details provided in the drawings set.
 - 1. Pre-Engineered Metal Building including structure, skin, insulation, flashing, downspouts, incorporation of provided point loads and forces. PEMB is proprietary engineered system and must be engineered by awarded contractor.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 012500 SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

1.03 REFERENCE STANDARDS

- A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.
- B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- D. Limit each request to a single proposed substitution item.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Submittal Time Restrictions:
- B. Submittal Form (before award of contract):
 - 1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):

1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Architect will consider requests for substitutions only within 15 days after date of Agreement.
- C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- D. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 3. Bear the costs engendered by proposed substitution of:
 - a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
 1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

SECTION 013000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Site mobilization meeting.
- E. Progress meetings.
- F. Construction progress schedule.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Requests for Interpretation (RFI) procedures.
- J. Submittal procedures.

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 017000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to Architect:
 - 1. Requests for Interpretation (RFI).
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 2. Contractor and Architect are required to use this service.
 - 3. It is Contractor's responsibility to submit documents in allowable format.
 - 4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no extra charge.
 - 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.

6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Submittal Service: The selected service is:
1. Procore.
- C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.
- D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

- A. After full execution of the construction contract by the contractor, and prior to the issuance of a Notice to Proceed, the RPR will schedule a preconstruction conference to review the project with the Contractor, the City and the FAA, as applicable. The Contractor's representatives at this meeting shall include all upper-level superintendents for the work and may include major subcontractors.
- B. During the meeting, the contractor shall submit to the Engineer/Architect:
- C. The Contractor's emergency telephone number and the name of the Contractor's emergency contact person
- D. Construction schedule.
- E. Quality Control Plan (Submitted 10 calendar days before the Quality Control (QC)/Quality Assurance (QA) workshop – See FAA QC of these specifications.)
- F. Safety Plan Compliance Document.
- G. Construction on this project cannot begin until these submittals have been reviewed and approved.
- H. Attendance Required:
1. Owner.
 2. Architect.
 3. Contractor.
- I. Agenda:
1. Execution of Owner-Contractor Agreement.
 2. Submission of executed bonds and insurance certificates.
 3. Distribution of Contract Documents.
 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 5. Designation of personnel representing the parties to Contract and Architect.
 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 7. Scheduling.
- J. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

- A. Schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
1. Contractor.
 2. Owner.
 3. Contractor's superintendent.

4. Major subcontractors.
- C. Agenda:
1. Use of premises by Owner and Contractor.
 2. Owner's requirements.
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Survey and building layout.
 6. Security and housekeeping procedures.
 7. Schedules.
 8. Application for payment procedures.
 9. Procedures for testing.
 10. Procedures for maintaining record documents.
 11. Requirements for start-up of equipment.
 12. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- B. Attendance Required:
1. Contractor.
 2. Owner.
 3. Architect.
 4. Contractor's superintendent.
 5. Major subcontractors.
- C. Agenda:
1. Review minutes of previous meetings.
 2. Review of work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede, or will impede, planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Maintenance of progress schedule.
 7. Corrective measures to regain projected schedules.
 8. Planned progress during succeeding work period.
 9. Maintenance of quality and work standards.
 10. Effect of proposed changes on progress schedule and coordination.
 11. Other business relating to work.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

- A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- C. Within 10 days after joint review, submit complete schedule.
- D. Submit updated schedule with each Application for Payment.

3.06 REQUESTS FOR INTERPRETATION (RFI)

- A. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - 2. Prepare using software provided by the Electronic Document Submittal Service.
- B. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- C. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
- D. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

3.07 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 017800 - Closeout Submittals.

3.08 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 017800 - Closeout Submittals:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

- A. General Requirements:
- B. Product Data Procedures:
 - 1. Submit only information required by individual specification sections.
 - 2. Collect required information into a single submittal.
 - 3. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 - 2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
 - 1. Transmit related items together as single package.
 - 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.12 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- D. Architect's and consultants' actions on items submitted for review:
 - 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Approved", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - 2. Not Authorizing fabrication, delivery, and installation:
- E. Architect's and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 013050
DESIGN PROCEDURES AND SUBSTANTIATION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for design of the facility, based on the design criteria specified.
- B. Substantiation requirements.

1.02 RELATED REQUIREMENTS

- A. Section 007100 - Contracting Definitions: Definitions of time periods and phase names.

1.03 DEFINITIONS

- A. Substantiation: All forms of evidence that are used to predict whether the design will comply with the requirements or to verify that the construction based on the design actually does comply. During Preliminary Design, Design Development, and Construction Documents, requirements to submit substantiation are primarily intended to forestall use of designs or constructions that will not comply. At any time before completion of construction, substantiation is presumed to be only a prediction and may subsequently be invalidated by actual results. The term substantiation is used to distinguish these forms of evidence from traditional submittals commonly required during the construction phase.
- B. Proven-In-Use: Proven to comply by having actually been built to the same or very similar design with the same materials as proposed (specified) and functioning as specified.
- C. Proven-by-Mock-Up: Compliance reasonably predictable by having been tested in full-scale mock-up using the same materials and design as proposed (specified) and functioning as specified. Testing need not have been accomplished specifically for this project; when published listings of independent agencies include details of testing and results, citation of test by listing number is sufficient (submittal of all test details is not required).

1.04 REFERENCE STANDARDS

- A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2021.

1.05 SUBMITTALS

- A. Substantiation Submittal Procedures:
 - 1. Time Frames: As specified. If there is a conflict between the degree of detail or completion specified and the progress of the design or construction, obtain a clarification before submitting (a clarification will be obtained before submitting).
 - 2. Recipient: Owner's project manager, at _____.
 - 3. Number of Copies: 2 copies for Owner's use and records; Owner will return not more than one additional copy.
 - 4. For time periods that constitute Milestones, all substantiation submittals required during that period must be complete and accepted before the Milestone can be considered achieved.
 - 5. Resubmissions: Clearly identified as such, with all changes made since the original submittal clearly marked.

1.06 QUALITY ASSURANCE

- A. Qualifications of Testing/Inspection Agencies Performing Substantiation:
 - 1. Qualified and equipped to perform applicable tests/inspection.
 - 2. Regularly engaged in testing and inspection activities on a commercial basis.
 - 3. Authorized to operate in the State in which the project is located.
 - 4. Substantiation: Submittal of qualifications, based on ASTM E329.

PART 2 PRODUCTS

2.01 OWNER-FURNISHED PRODUCTS

- A. Owner-furnished products for this project are:
 - 1. Specific furniture listed on the plans.

2.02 DESIGN-BUILDER FURNISHED PRODUCTS

- A. In addition to requirements specified in other sections, provide products and elements that comply with the following.
- B. Elements Made Up of More Than One Product:
 - 1. Where an element is specified by performance criteria, use (the project will use) construction either proven-in-use or proven-by-mock-up, unless otherwise indicated.
 - a. The Design-Builder may choose whether to use elements proven-in-use or proven-by-mock-up, unless either option is indicated as specifically required.
 - b. Where test methods accompany performance requirements, use those test methods (those test methods will be used) to test the mock-up.
 - 2. Where a type of product is specified, without performance criteria specifically applicable to the element, use (the project will use) the type of product specified.
 - 3. Where more than one type of product is specified, without performance criteria specifically applicable to the element, use (the construction will use) one of the types of products specified.
 - 4. Where a type of product is specified, with applicable performance criteria, use (the construction will use) either the type of product specified or another type of product that meets the performance criteria as proven-in-use or proven-by-mock-up.
 - 5. Where more than one type of product is specified, with applicable performance criteria, use (the construction will use) either one of the types of products specified or another type of product that meets the performance criteria as proven-in-use or proven-by-mock-up.
 - 6. Where neither types of products nor performance criteria are specified, use (the construction will use) products that will perform well within the specified life span of the building.
- C. Products:
 - 1. Where a product is specified only by a manufacturer name and model number/brand name, use (the construction will use) only that model/brand product.
 - 2. Where the properties of a product are specified by description and/or with performance criteria, use (the construction will use) products that comply with the description and/or performance criteria.
 - 3. Where manufacturers are listed for a particular product, use (the construction will use) a product made by one of those manufacturers that also complies with other requirements.
- D. Reference Standards: Where products or workmanship is specified by reference to a document not included in Contract Documents, comply (the construction will comply) with the requirements of the document, except where more stringent requirements are specified.
 - 1. Date of Issue: As indicated in each instance except where a specific date is established by code.

PART 3 EXECUTION

3.01 DESIGN

- A. During Preliminary Design, the design criteria and the design itself must be (will be) refined, finalized, and documented.
- B. Owner will appoint representatives of the following departments to provide details of functional needs:
 - 1. User groups.
 - 2. Operations staff.
 - 3. Maintenance staff.

- C. Design Documentation: Record (Documentation will include) all design and performance criteria that will be of use during occupancy and operation of the project, including all items specified for maintenance manuals, below.
1. Design Criteria Documentation Included in Construction Documents: Organized logically (from the point of view of operations staff) and placed in a prominent location in drawing sets.
 2. If desired, documentation may consist of annotated modifications to and amplification of the Conceptual Documents, with changes that affect Contract Times or Contract Price documented as required for modifications.
 3. If required, shop drawings may be used to accomplish design documentation.
 4. Owner will maintain the project program document, modified to reflect changes made during refinement of the design.
 5. Drawings: Prepared using AutoCAD R14, using Owner's specified drawing and layering conventions.
 6. Shop Drawings: Prepared using same CAD software.
 7. Mock-Ups: Where necessary to clarify design intent and obtain approvals, construct full-scale mock-ups (full-scale mock-ups will be constructed).

3.02 PERFORMANCE OF SUBSTANTIATION

- A. In addition to the requirements stated in other sections, provide (we will provide) the following substantiation of compliance at each stage of the project:
1. If a substantiation requirement is specified without an indication of when it is to be submitted, submit or execute (we will submit or execute) it before the end of Construction Documents.
- B. Proven-In-Use: Where elements proven-in-use are used to comply with performance requirements:
1. In the Proposal, identify (we will identify) which elements will be accomplished using proven-in-use elements.
 2. During Design Development, identify (we will identify) proven-in-use elements proposed for use, including building name, location, date of construction, owner contact, and description of design and materials in sufficient detail to enable reproduction in this project.
- C. Proven-By-Mock-Up: Where elements proven-by-mock-up are used to comply with performance requirements:
1. In the Proposal, identify (we will identify) which elements will be accomplished using proven-by-mock-up elements.
 2. During Design Development, identify (we will identify) proven-by-mock-up elements proposed for use, with test report including date and location of test, name of testing agency, and description of test and mock-up.
 3. Mock-up testing need (may) not have been performed specifically for this project, provided the mock-up is substantially (but the mock-up will be very) similar in design and construction to the element proposed.
- D. Design Analyses (including Engineering Calculations):
1. Where a design analysis or calculation is specified without identifying a particular method, perform analysis (analysis will be performed) in accordance with accepted engineering or scientific principles to show compliance with specified requirements, and submit (with) report that includes analysis methods used and the name and qualifications of the designer.
 2. Where engineering design is allowed to be completed after commencement of construction, substantiation may be in the form of shop drawings or other data.
 3. Submit design analyses (Design analyses will be submitted) at the end of Design Development unless otherwise indicated.
 4. Where design analysis is specified to be performed by licensed design professional, use (we will use) a design professional licensed in the State in which the Project is located.

- E. Substantiation for Products:
1. Where actual brand name products are not identified by either the Owner or the Design-Builder, identify (we will identify) the products to be used.
 2. In the Proposal:
 - a. Identify (We will identify) one or more product types for each system, assembly, or element.
 - b. For each product type, provide (we will provide) brief descriptive or performance specifications.
 - c. For major manufactured products that are commonly purchased by brand name, and any other products so indicated, identify (we will identify) at least one manufacturer that will be used.
 3. During Preliminary Design or Design Development:
 - a. Where more than one product type is identified for a particular system, assembly, or element, identify (we will identify) exactly which type will be used.
 - b. For each product type, provide (we will provide) descriptive or performance specifications; early submittals may (will) be brief specifications, but complete specifications are required (will be provided) prior to completion of construction documents.
 - c. For each product type, identify (we will identify) at least one manufacturer that will be used.
 - d. For major manufactured products that are commonly purchased by brand name, and any other products so indicated, provide (we will provide) manufacturer's product literature on at least one actual brand name product that meets the specifications, including performance data and sample warranty.
 4. During Construction:
 - a. Identify (We will identify) actual brand name products used for every product, except commodity products specified by performance or description.
 - b. Where a product is specified by performance requirements with test methods, and if so specified, provide (we will provide) test reports showing compliance.
 - c. Provide (We will provide) manufacturer's product literature for each brand name product.
 - d. Provide (We will provide) the manufacturer's certification that the product used on the project complies with Contract Documents.
 5. Before End of Closeout:
 - a. Provide (We will provide) copies of all manufacturer warranties that extend for more than one year after completion.
- F. Regardless of whether substantiation is specified or not, the actual construction must (will) comply with the specified requirements and may, at the Owner's discretion, be examined, inspected, or tested to determine compliance.
1. Substantiation submittals will not be approved or accepted, except to the extent that they are part of documents required to be approved or accepted in order to proceed to the next stage of design or construction. However, approval or acceptance of substantiation will not constitute approval or acceptance of deviations from the specified requirements unless those deviations are specifically identified as such on the submittal.
 2. The Owner accepts the responsibility to review substantiation submittals in a timely manner and to respond if they are unacceptable.

3.03 FIELD TESTING AND INSPECTION AS SUBSTANTIATION

- A. Perform (Construction operations will include) all testing , observation, and inspection required by code and as specified.
- B. Reports: Written report of each test/inspection; including complete details of conditions, methods, and results, signed by responsible individual.

END OF SECTION

**SECTION 013591
PERIOD TREATMENT PROCEDURES**

PART 2 - PRODUCTS

1.01 PROTECTION PRODUCTS

- A. Adhesive Walk-Off, Tacky Mats: Mats with multiple layers of disposable, adhesive-coated sheets.

1.02 CLEANING MATERIALS

- A. General: Do not use incompatible materials that may contribute to damage of the element being cleaned.
- B. Use products specifically intended by the manufacturer for cleaning historic materials or elements.

1.03 REPAIR MATERIALS

- A. General: Do not use incompatible materials contributing to damage of repaired elements.
- B. Matching: Unless otherwise required, use new materials that match historic materials in type, design, dimension, texture, detailing, and external appearance.

END OF SECTION

**SECTION 014000
QUALITY REQUIREMENTS**

PART 3 EXECUTION

1.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

1.02 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

**SECTION 016000
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations.
- E. Procedures for Owner-supplied products.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 012500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- B. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- C. Section 017419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
- C. Where other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower emissions, as defined in Section 016116.
 - 2. If wet-applied, have lower VOC content, as defined in Section 016116.

2.02 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 012500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 017419.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.

- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 016116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for Indoor-Emissions-Restricted products.
- B. Requirements for VOC-Content-Restricted products.

1.02 RELATED REQUIREMENTS

- A. Section 013000 - Administrative Requirements: Submittal procedures.

1.03 DEFINITIONS

- A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
- B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
- F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
 - 1. Concrete.
 - 2. Clay brick.
 - 3. Metals that are plated, anodized, or powder-coated.
 - 4. Glass.
 - 5. Ceramics.
 - 6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2025.
- C. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2020.
- D. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).
- E. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

1.06 QUALITY ASSURANCE

- A. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.

- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

- A. VOC-Content-Restricted Products: VOC content not greater than required by the following:
 - 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2. Joint Sealants: SCAQMD 1168 Rule.
 - 3. Paints and Coatings: Each color; most stringent of the following:
 - a. 40 CFR 59, Subpart D.
 - b. SCAQMD 1113 Rule.
 - c. CARB (SCM).

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

**SECTION 017000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 078400 - Firestopping.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.

2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-complying work.
- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
 - D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
 - E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
 - F. Restore work with new products in accordance with requirements of Contract Documents.
 - G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
 - H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 078400, to full thickness of the penetrated element.
 - I. Patching:
 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 2. Match color, texture, and appearance.
 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.05 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.06 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.07 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.08 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.09 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Contractor Reporting Responsibilities: Submit periodic Waste Disposal Reports; report landfill disposal, incineration, recycling, salvage, and reuse regardless of to whom the cost or savings accrues; use the same units of measure on required reports.
- E. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

- A. Section 013000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- C. Section 016000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- D. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
 - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - 2. Submit Report on a form acceptable to Owner.
 - 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
 - 6. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards (cubic meters).
 - c. Include weight tickets as evidence of quantity.

7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 013000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 1. Prebid meeting.
 2. Preconstruction meeting.
 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 1. Provide containers as required.
 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 017800 CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Materials transparency manual.
- D. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 013000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- B. Section 017000 - Execution and Closeout Requirements: Contract closeout procedures.
- C. Individual Product Sections: Specific requirements for operation and maintenance data.
- D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 3. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Materials Transparency Manual:
 - 1. Compile and submit a digital and a printed version of information disclosing materials content for interior finishes, furnishings (including workstations), built-in furniture. Meet IWBI (BS) requirements for format and content.
- D. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Addenda.
 - 3. Change Orders and other modifications to the Contract.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.

- D. Record information concurrent with construction progress.
- E. Record Drawings: Legibly mark each item to record actual construction including:
 - 1. Field changes of dimension and detail.
 - 2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- B. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- C. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

**SECTION 017900
DEMONSTRATION AND TRAINING**

PART 1 GENERAL

1.01 SUMMARY

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures; except:
 - 1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
 - 2. Submit one copy to the Commissioning Authority, not to be returned.
 - 3. Make commissioning submittals on time schedule specified by Commissioning Authority.
 - 4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

1.03 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

END OF SECTION

SECTION 031000 CONCRETE FORMING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Formwork for cast-in-place concrete with shoring, bracing, and anchorage.
 - 2. Openings for other Work.
 - 3. Form accessories, sealers, and release agents.
 - 4. Form stripping.
- B. Related Sections
 - 1. Section 03 15 00 - Concrete Accessories.
 - 2. Section 03 20 00 - Concrete Reinforcing.
 - 3. Section 03 30 00 - Cast-in-Place Concrete.
 - 4. Section 03 30 50 - Concrete Testing and Inspection.
 - 5. Section 03 60 00 – Grouting.
 - 6. Section 07 92 00 - Joint Sealants.

1.02 REFERENCE

- A. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ACI 347 - Guide to Formwork for Concrete.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 30 50 – Design Procedures and Substantiation Requirements.
- B. Product Data
 - 1. Product data for products and materials indicated.
 - 2. Manufacturer's technical bulletins and installation/application instructions.
 - 3. Material Safety Data Sheets (MSDS).

1.04 COORDINATION

- A. Coordinate the design, construction and installation of concrete formwork with the requirements for openings, sleeves, chases, pipes, recesses, nailers, anchors, ties, inserts and other embedded items required by other Sections.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Store products subject to damage by dirt and moisture in a clean, dry location, off the ground and suitably protected.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Form materials shall be salvageable, reusable and recyclable.
- B. Use flexible spring-steel forms or laminated boards to form radius bends.
- C. Form Lumber: Douglas Fir, Construction Grade, No. 2 or better, S1S2E.
- D. Plywood: Five-ply, 3/4 inch thick, APA B-B Plyform, Class I, Exterior Type with mill-oiling treatment omitted.

2.02 EARTH FORMS

- A. Where approved, vertical excavated surfaces may be used for forms for slabs on grade and grade beams, provided that the earth will stand without caving and that suitable provisions are taken to prevent raveling of top edges or sloughing of loose materials from the walls of the excavation.

- B. Where earth forms are permitted, clear dimensions as indicated shall be maintained and any over-excavation shall be filled monolithically with concrete.
- C. Construct wood edge strips at top sides of excavations.

2.03 ACCESSORIES

- A. Accessories which will be wholly or partially embedded in concrete, such as ties and hangers, shall be a commercially manufactured type, of metal; wire will not be acceptable.
- B. The portion remaining in the concrete shall leave no metal within 1 inch of concrete face and no fractures, spalls, depressions, or other surface disfigurations greater than 3/4 inch in diameter.
- C. Spreader cones on ties shall not exceed 1 inch in diameter.

2.04 FINISHES

- A. Form Sealer: Type to eliminate grain raise as a result of moisture and shall not interfere with color, bond, or subsequent treatment of concrete surface.
 - 1. Manufacturers
 - a. W.R. Meadows; Duogard II = Water-based form release agent.
 - b. BASF Construction Chemicals.; Cast-off: Nonstaining form-release agent.
 - c. EDOCO/Burke; "Form Sealer" (also known as "Kwik Koat Form Coating").
- B. Form Release Agent
 - 1. For Exposed Concrete to Receive Paint or Other Coatings: Chemically active type producing water-insoluble soaps. Release agents shall contain no petroleum solvents such as creosote, paraffin, wax or diesel oils.
 - 2. Unexposed Concrete: Any type that will not interfere with bond of applied finishes.

PART 3 EXECUTION

4.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive the Work. Notify the Owner's Representative, in writing, of any conditions requiring corrective action.
- B. If unsatisfactory conditions exist, do not commence the installation until such conditions have been corrected. Beginning of installation means acceptance of existing conditions.

4.02 PREPARATION

- A. Whenever concrete bases or foundations are to be provided for equipment provided as part of the Work of other Sections, verify dimensions for the equipment to be provided before concrete is placed.
- B. Coordinate locations of openings, sleeves, chases, pipes, recesses, nailers, anchors, ties, inserts and other embedded items.

4.03 INSTALLATION

- A. All cast-in-place concrete shall be contained by constructed forms or stable earth forms.
- B. Design, construct, and brace formwork and temporary falsework to safely support concrete and safely hold personnel during construction operations.
- C. Construct forms of sufficient strength and rigidity to produce finished concrete of the precise size, shape, and location indicated, within the specified tolerances. Form assembly shall permit removal in proper sequence without damage to concrete.
- D. Arrange forms to permit single placement of exposed areas and panels without joints between adjacent forming materials in the same plane.
- E. Construct forms for architectural concrete full height and width between construction joints in concrete surface.
- F. Construct forms no higher than 12 inches above the top of a placement or construction joint.
- G. Construction Joints
 - 1. Form in accordance with requirements of Section 03 30 00.

2. Provide a surfaced strip where construction joints intersect exposed surfaces; faces to provide straight lines at joints. Prior to subsequent placement, remove strip and tighten forms.
 3. Construction joints shall show no overlapping or offsetting of concrete surfaces and shall, as closely as possible, present the same appearance as butted plywood joints.
 4. Joints in a continuous line shall be straight and true.
- H. Provide cleanouts as required to permit inspection and thorough cleaning of loose dirt, debris, and waste material. Cleanouts shall not be apparent on concrete surfaces exposed to view in the finished Work.
 - I. Chamfered Corners
 - J. Chamfer exposed corners unless otherwise indicated.
 - K. Obtain chamfers by placing 3/4 x 3/4-inch non-staining moldings in forms. Provide pieces in longest lengths possible and miter joints.
 - L. For surfaces exposed to view in the finished Work, forms shall be constructed of plywood.
 - M. For surfaces not exposed to view in the finished Work, forms shall be lumber, form plywood, or any other suitable material.
 - N. Formwork shall be clean and free of debris when concrete is placed.
 - O. Forms shall be sufficiently tight to prevent leakage of water and mortar.
 - P. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
 - Q. Locate temporary openings on forms at inconspicuous locations.
 - R. Provide openings in formwork to accommodate the Work of other Sections. Accurately place and securely support items built into forms.

4.04 FINISHES

- A. Treat contact surface of plywood and lumber forms with a form sealer in accordance with the manufacturer's printed instructions.
- B. Clean surfaces and reseal before each use to ensure undamaged concrete.
- C. Do not use form oil.

4.05 TOLERANCES

- A. Construct formwork to tolerances specified in ACI 347, except that anchor bolt setting tolerances shall be in accordance with AISC Code of Standard Practice, Section 7.5.
- B. Where tighter tolerances are required to accommodate detention equipment or other items specified in other Sections, construct formwork to the most restrictive tolerance.

4.06 STRIPPING OF FORMS

- A. Strip forms using methods which will not damage concrete.
- B. Do not remove forms until concrete has attained sufficient strength to support its own weight and construction live loads to be placed thereon without damage to the structure, but not before minimum time as follows:
 1. Side Forms of Footings, Curbs, Walks, and Paving: 24 hours.

4.07 RESHORING

- A. Submit re-shoring plan to the Owner's Representative if forms are to be stripped earlier than specified above.

4.08 RE-USE OF FORMS

- A. Re-use of forming materials shall be subject to the approval of the Owner's Representative, provided the material is structurally sound, free of defects and blemishes. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. In no case shall forming materials be used more than four times.
- B. Clean and repair surfaces of forms to be reused in the Work. Apply new form coating compound as specified for new formwork.
- C. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces.

END OF SECTION

SECTION 032000 CONCRETE REINFORCING

GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Reinforcing steel bars, wire fabric, and accessories for concrete.
- B. Related Sections
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 15 00 - Concrete Accessories.
 - 3. Section 03 30 00 - Cast-in-Place Concrete.
 - 4. Section 03 30 50 - Concrete Testing and Inspection.
 - 5. Section 03 60 00 - Grouting.

1.02 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete.
- B. ACI 315 - Details and Detailing of Concrete Reinforcement.
- C. ACI 318 - Building Code Requirements for Structural Concrete.
- D. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement.
- E. ASTM A185 - Steel Welded Wire Reinforcement, Plain, for Concrete.
- F. ASTM A497 - Steel Welded Wire Reinforcement, Deformed, for Concrete
- G. ASTM A615 - Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- H. ASTM A706 - Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
- I. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- J. CRSI - Manual of Standard Practice, Latest Edition.
- K. CRSI - Placing Reinforcing Bars, Latest Edition.
- L. WWR-500 Latest Edition - Structural Welded Wire Reinforcement Manual of Standard Practice.
- M. CCR - California Code of Regulations: Title 24, 2022 - California Building Code (CBC).

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 30 50 – Design Procedures and Substantiation Requirements.
- B. Shop Drawings
 - 1. Detail reinforcement in accordance with ACI 315.
 - 2. Indicate bending and placing details of reinforcement; bar sizes, spacing, locations, and quantities of reinforcing steel and wire fabric; bending and cutting schedules; supporting and spacing devices.
- C. Product Data
 - 1. Product data for products and materials indicated.
 - 2. Manufacturer's technical bulletins and installation/application instructions.
 - 3. Material Safety Data Sheets (MSDS).
 - 4. For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
- D. Certificates
 - 1. Welding Certificates: In conformance with AWS D1.4.
 - 2. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 3. Mill Test Report: Certified copies of reinforcement materials analysis.

1.04 COORDINATION

- A. Coordinate reinforcement with placement of formwork, anchor bolt locations, anchors, inserts, conduit, sleeves, and other items required to be cast in concrete. Ensure reinforcement will not interfere with the placement of such items, formed openings, and other Work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Reinforcing steel shall be delivered from the mill in securely tied bundles, each bundle limited to one size and grade of material. Plastic or metal tags in an exposed position on each bundle shall identify the mill, the melt or heat number, and the grade and size of material. Identification of steel shall be maintained after bundles are broken.
- B. After fabrication, reinforcing steel shall be bundled and tagged for identification at the site. Tags shall identify the steel by the reinforcement item marking indicated on the approved shop drawings and the quantity of such item contained in the bundle.
- C. Segregate to maintain identification after bundles are broken.
- D. Store off the ground, protected from the elements and contaminants which could adversely affect bond.

PRODUCTS

2.01 MATERIALS

- A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.
- B. Reinforcing Steel
 - 1. #3 Bars: ASTM A615, Grade 40 deformed low alloy steel bars, plain.
 - 2. #4 Bars and larger: ASTM A615, Grade 60 deformed billet steel bars, plain finish, unless otherwise indicated.
 - 3. Reinforcing Steel to be Welded: ASTM A706, Grade 60 deformed low alloy steel bars, plain finish.
- C. Welded Wire Reinforcement: ASTM A185 Plain Type. Provide in flat mats, rolls are not acceptable.
- D. Welded Deformed Steel Reinforcement: ASTM A497.

2.02 ACCESSORIES

- A. Wire for Ties, Stirrups, and Spiral Reinforcement: ASTM A82, minimum 16 gauge.
- B. Splice Sleeves: Steel splice sleeves conforming to requirements of ACI 318 and CBC, Chapter 19 for mechanically spliced reinforcing. Each splice sleeve shall be identified with the size, type, and manufacturer's identification imprinted on the sleeve.
 - 1. Manufacturers
 - a. Splice Sleeve North America; NMB Splice Sleeve.
 - b. Erico Products, Inc.; Lenton Interlock Rebar Splicing System.
 - c. Dayton/Richmond; US/MC - SAE Coupler Splice System.
- C. Chairs, Bolsters, Spacers, Bar Supports, and Other Accessories
 - 1. Conform to requirements of ACI 315; size and shape for strength and support of reinforcement during concrete placement conditions.
 - 2. Where portion of accessories will be within 1/2 inch of concrete surfaces exposed to the weather in the finished Work, such accessories shall be made of stainless steel.
 - 3. Use wire bar type support complying with CRSI recommendations, unless otherwise indicated.
 - 4. For slabs on grade, use supports with sand plates or horizontal runners where wetted base materials will not support chair legs.

5. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are hot-dip galvanized, or plastic or stainless steel protected.
 6. Over vapor barriers or waterproof membranes use load-bearing bottom pads or precast concrete chairs to prevent penetration of the membrane.
- D. Welding Filler Metal
1. E70XX for Grade 40 bars, low hydrogen electrodes.
 2. E90XX for Grade 60 bars, low hydrogen electrodes.

2.03 FABRICATION

- A. Fabrication of reinforcement items shall proceed only after approval of bar lists and shop drawings. Each unit of reinforcement shall be fabricated in accordance with the approved bar lists and shop drawings.
- B. Reinforcing steel shall be bent cold and shall not be straightened or rebent in a manner that will damage the material.
- C. Fabricate reinforcing in accordance with ACI 318 and CBC, Chapter 19.
- D. Locate reinforcing splices in accordance with approved shop drawings.

EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive the Work. Notify the Owner's Representative, in writing, of any conditions requiring corrective action.
- B. If unsatisfactory conditions exist, do not commence the installation until such conditions have been corrected. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Reinforcement shall be supported and fastened together to prevent displacement by construction loads or by the placement of concrete, beyond the tolerances specified in ACI 301. Sizes and dimensions of supports shall be as required to position the steel as indicated on the Drawings, the approved shop drawings, and in accordance with the minimum concrete protective covering requirements of ACI 301.
- B. Provide reinforcing bars full length, to the extent practicable.
- C. Splices in Reinforcing Bars
 1. Splices will be permitted only where indicated on the Contract Documents, the approved shop drawings, or as otherwise approved by the Owner's Representative.
 2. Lapped ends of bars may be placed in contact and securely wired or may be separated sufficiently to permit the embedment of the entire surface of each bar in concrete.
 3. Lap bars as indicated, but no less than 48 bar diameters.
 4. Stagger splices in adjacent bars.
 5. Sleeved Splices: Install splice sleeves in accordance with manufacturer's instructions; permitted only where indicated.
- D. Lap welded wire fabric reinforcement 12 inches at edges, unless otherwise indicated, and wire together.
- E. Obstructions: Should conduit, pipes, inserts, sleeves, or other items interfere with the placement of reinforcement, notify the Owner's Representative and obtain approval of procedure before placement of concrete is started.
- F. Welding
 1. Do not weld reinforcement unless specifically indicated on the Drawings or directed by the Owner's Representative.
 2. Conform to the requirements of AWS D1.4 with welding performed by AWS certified welders.
- G. Do not displace or damage vapor barrier.

- H. Accommodate placement of formed openings.
- I. Dowels shall be tied securely in place before concrete is deposited. Bending of dowels subsequent to concrete placement is not permitted.

3.03 TOLERANCES

- A. Reinforcement shall be placed within tolerances specified in ACI 301.

3.04 TESTING AND INSPECTION

- A. Testing and inspection shall be in accordance with the provisions of Division 01.
- B. Obtain inspection and approval of reinforcing before concrete is placed.

3.05 CLEANING

- A. At time of concrete placement, reinforcement shall be free of coatings that could adversely affect the bond with concrete.

3.06 REPAIR AND ADJUSTMENT

- A. Misplaced bars shall not be bent.

3.07 DEFECTIVE WORK

- A. If reinforcing bars are found to be misplaced after concrete has been placed, immediately notify the Owner's Representative and make no correction or cutting without the Owner's Representative review and recommendations.
- B. Required repair or replacement of misplaced reinforcement will be determined by the Owner's Representative.
- C. Misplaced reinforcement shall be repaired or replaced as recommended by the Owner's Representative at no additional expense to the Owner.

3.08 PROTECTION

- A. Continuously inspect and maintain reinforcement in proper position during concrete operations.

END OF SECTION

SECTION 036000

GROUTING

GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Drypack, Epoxy, Nonshrink, and Cement Grout.

1.02 REFERENCES

- A. ACI 318 - Building Code Requirements for Structural Concrete.
- B. ASTM C33 - Concrete Aggregates.
- C. ASTM C150 - Portland Cement.
- D. ASTM C494 - Chemical Admixture for Concrete.
- E. CRD-C621 Corps of Engineers - Specification for Nonshrink Grout.
- F. CCR - California Code of Regulations: Title 24, 2022 - California Building Code (CBC).

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 30 50 – Design Procedures and Substantiation Requirements.
- B. Product Data
 - 1. Product data for products and materials indicated.
 - 2. Manufacturer's technical bulletins and installation/application instructions.
 - 3. Material Safety Data Sheets (MSDS).
- C. Certificates
 - 1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Mix Designs: Submit separate mix design for each type of grout specified.

1.04 COORDINATION

- A. Coordinate the installation of grout with the requirements of the Work of other Sections.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle packaged materials in the manufacturer's original, sealed containers, each clearly identified with the manufacturer's name, and name and type of product.
- B. Store products subject to damage by dirt and moisture in a clean, dry location, off the ground, and suitably protected.

PRODUCTS

2.01 MATERIALS

- A. Cement: ASTM C150, Type II Portland cement; low alkali, containing less than 0.60 percent alkalis.
- B. Fine Aggregate: ASTM C33, except as modified below; nonreactive; hard, dense, durable particles of either sand or crushed stone, regularly graded from coarse to fine; washed before use.
- C. Water
 - 1. Free from oil and deleterious amounts of acids, alkalis, and organic materials.
 - 2. Containing not more than 1,000 mg/l of chlorides as Cl.
 - 3. Containing not more than 1,300 mg/l of sulfates as SO₄.
 - 4. Not containing impurities that may cause a change of more than 25 percent in the setting time of the cement, nor a reduction of more than 5 percent in the compressive strength of the grout at 14 days when compared with the result obtained with distilled water.
 - 5. Water used for curing shall not contain impurities sufficient to cause discoloration.

- D. Acquire cement and aggregate from same source for all the Work.

2.02 ADMIXTURES

- A. Admixtures shall be compatible with the grout.
- B. Calcium chloride or admixtures containing calcium chloride are prohibited.
- C. Water Reducing Retarder: ASTM C494, Type D.
 - 1. Manufacturers
 - a. BASF/Master Builders; Pozzolith 300-R.
 - b. Sika Chemical Corp; Plastiment.
 - c. Euclid Chemical Company; Eucon Retarder 75.
- D. Lubricant Additive for Cement Pressure Grouting
 - 1. Manufacturers
 - a. Specrete; Prepakt Intrusion Aid.
 - b. Sika Chemical Corp; Intraplast N.

2.03 DRYPACK GROUT

- A. Mix: One part cement, 1-1/2 to two parts sand, water reducing retarder, and water to make a stiff workable mix.

2.04 CEMENT GROUT

- A. Mix: One part cement and two parts sand, proportioned by volume, admixtures for pressure grouting, water to make a workable mix.

2.05 NONSHRINK GROUT

- A. Corps of Engineers CRD C621; Nonshrink type, pre-mixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days, unless otherwise indicated.
- B. Manufacturers
 - 1. Master Builders/ BASF; Masterflow 713.
 - 2. Five Star products, Inc; Precision Nonshrink Cement Grout.
 - 3. Euclid Chemical; Euco Nonshrink Grout.
 - 4. Five Star Products, Inc.; Five Star Grout.
 - 5. W.R.Meadows; Sealtight 588.

2.06 EPOXY GROUT

- A. Manufacturers
 - 1. Master Builders/BASF; Concreative 1380.
 - 2. Sika Chemical Corporation; Sikadur -42.
 - 3. Euclid Chemical; E3-F.

EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive the Work. Notify the Owner's Representative, in writing, of any conditions requiring corrective action.
- B. Verify that anchors, seats, plates, embeds, reinforcement, and other items to be grouted are accurately placed, positioned securely, and will not cause hardship during grouting.
- C. Ensure bolts and reinforcing to be installed in horizontal grout holes is slightly bent to accommodate angle of hole.
- D. If unsatisfactory conditions exist, do not commence the installation until such conditions have been corrected. Beginning installation means acceptance of existing conditions.

3.02 PREPARATION

- A. Holes required for grouting

1. Drill horizontal holes at a slight downward angle to facilitate holding the grout until setting is complete.
 2. Blow holes clean prior to installation of grout.
- B. Thoroughly clean reinforcement and other embedded items free from loose rust and other objectionable matter.
- C. Protect elements surrounding Work of this Section from damage or disfiguration.

3.03 **INSTALLATION**

- A. Drypack Grout
1. Roughen surfaces to be built-up with drypack grout by brushing; clean, and coat with bonding compound immediately prior to grout application.
 2. Apply drypack grout immediately following application of bonding compound.
 3. Apply in bands or strips to form a smooth covering of the required thickness.
 4. Completely fill voids; thoroughly compact in place.
 5. Slope construction joints; clean and wet surface before application is resumed.
 6. Membrane cure drypack grout.
 7. Bolts or inserts which have been dry packed or grouted in place shall not be tensioned sooner than seven days after packing.
- B. Cement Grout
1. Place using pressure grouting equipment or mixing and placement apparatus of type used for cast-in-place concrete.
 2. Agitate diluted grout to keep ingredients mixed.
- C. Nonshrink Grout
1. Install in accordance with manufacturer's instructions.
- D. Epoxy Grout
1. Install in accordance with manufacturer's instructions.
 2. Prime surface of concrete when required by manufacturer's instructions.
- E. Pressure Grout
1. Equipment
 - a. Designed to place grout at pressures up to 50 psi. Include mixer and holdover agitator tanks.
 - b. Gauges: Indicate pressure used for grout placement, up to 50 psi.
 - c. Meter: Capable of indicating the volume of grout used, to within 1/10 cubic foot.
 2. Prior to grouting, wash clean systems and holes to be grouted.
 3. Once begun, complete grouting without stopping. Maintain grout pressure until grout has set.
 4. In case of equipment failure, wash out the grouting system sufficiently to ensure fresh grout and adequate bond and penetration will occur upon restarting the grouting operation.

3.04 **FIELD QUALITY CONTROL**

- A. Do not apply drypack grout when ambient temperature is below 40 degrees F. Maintain ambient temperature above 40 degrees F for 48 hours after application.

3.05 **TESTING AND INSPECTION**

- A. Testing and inspection shall be in accordance with the provisions of Division 01.
- B. Do not place grout until reinforcing and embeds have been inspected and approved by the Owner's Representative.
- C. Notify the Owner's Representative 48 hours before each grouting operation.

3.06 **CLEANING**

- A. Clean, leaving exposed surfaces free from damage, tool marks, stains, discoloration, and other defects and damage.

3.07 DEFECTIVE WORK

- A. Grout not conforming to required details, dimensions, tolerances, finishes, strength, or other specified requirements shall be considered defective. Notify the Owner's Representative upon discovery of these conditions.
- B. Required repair or replacement of defective grout will be determined by the Owner's Representative.
- C. Do not patch, fill, touch-up, repair, or replace grout except upon express direction of the Owner's Representative for each individual area.
- D. Defective grout shall be repaired or replaced as recommended by the Owner's Representative at no additional expense to the Owner.

3.08 PROTECTION

- A. Protect grout from damage from subsequent construction operations.

3.09 SCHEDULE

- A. Drypack Grout: Used for built-up surfaces, setting miscellaneous metal items, and minor repairs.
- B. Epoxy Grout: Used for repairing cracks by pressure grouting, repairing structural concrete, setting reinforcing dowels into holes for grouting.
- C. Nonshrink Grout: Used for bearing surfaces of machinery and equipment bases, column baseplates and bearing plates, setting bolts and reinforcing steel in holes for grouting.
- D. Cement Grout: Used for filling nonbearing portions of equipment pads and pressure grouting.

END OF SECTION

**SECTION 054000
COLD-FORMED METAL FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Formed steel stud exterior wall framing.
- B. Exterior wall sheathing.

1.02 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- E. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with work of other sections that is to be installed in or adjacent to metal framing systems, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.
- C. Design Data:
 - 1. Details and calculations for factory-made connectors, signed and sealed by a professional structural engineer.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a professional structural engineer experienced in designing this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Structural Framing:
 - 1. CEMCO: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3. Jaimes Industries: www.jaimesind.com/#sle.
 - 4. MarinoWARE: www.marinoware.com/#sle.
 - 5. SCAFCO Corporation: www.scafco.com/#sle.
 - 6. Steel Construction Systems: www.steelconsystems.com/#sle.
 - 7. The Steel Network, Inc: www.SteelNetwork.com/#sle.
 - 8. Substitutions: See Section 016000 - Product Requirements.
- B. Connectors:
 - 1. Same manufacturer as metal framing.

2.02 PERFORMANCE REQUIREMENTS

- A. Design Requirements: Design cold-formed framing systems, components and connectors to withstand specified design loads in compliance with ICC (IBC), ASCE 7, AISI S100, and AISI S240.
- B. Design Criteria: In accordance with applicable codes.
 - 1. Live load deflection meeting the following, unless otherwise indicated:
 - 2. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
 - 3. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.03 MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

2.04 STRUCTURAL FRAMING COMPONENTS

- A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.

2.05 CONNECTIONS

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 PREPARATION

3.03 INSTALLATION - GENERAL

- A. Install structural members and connections in compliance with AISI S240.

3.04 INSTALLATION OF STUDS

- A. Install wall studs plumb and level.
- B. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

END OF SECTION

SECTION 055133 METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop-fabricated metal ladders.
- B. Prefabricated ladders.

1.02 RELATED REQUIREMENTS

- A. Section 099113 - Exterior Painting: Paint finish.
- B. Section 099123 - Interior Painting: Paint finish.
- C. Section 118129 - Facility Fall Protection: Ladder safety systems.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1910.23 - Ladders; Current Edition.
- B. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- C. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- I. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED LADDERS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
 - 1. Side Rails: 3/8 by 2 inches (9 by 50 mm) members spaced at 20 inches (500 mm).
 - 2. Rungs: One inch (25 mm) diameter solid round bar spaced 12 inches (300 mm) on center.
 - 3. Space rungs 7 inches (175 mm) from wall surface.

2.05 PREFABRICATED LADDERS

- A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
 - 1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
 - 2. Finish: Powder coat; color to be selected by Architect from manufacturer's standard range.
 - 3. Manufacturers:
 - a. O'Keeffe's Inc; Model 500: www.okeeffes.com/#sle.
 - b. Precision Ladders, LLC; Fixed Aluminium Wall Ladder: www.precisionladders.com/#sle.
 - c. Or approved equal.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.06 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Do not prime surfaces where field welding is required.
- B. Prime Painting: One coat.

2.07 FINISHES - ALUMINUM

- A. Exterior Aluminum Surfaces: Class I natural anodized.
- B. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

- C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
- C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 071300
SHEET WATERPROOFING - WR MEADOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Self-adhered modified bituminous sheet membrane.

1.02 REFERENCE STANDARDS

- A. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store sheet waterproofing materials under cover and elevated above grade.

1.05 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until liquid or mastic accessories have cured.

1.06 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Sheet Waterproofing:
 - 1. W. R. Meadows, Inc; Air-Shield Low Temp: www.wrmeadows.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 APPLICATIONS

- A. Self-Adhered Modified Bituminous Sheet Membrane:
 - 1. Location: CMU.
 - 2. Cover with protection board.

2.03 MATERIALS

- A. Self-Adhered Modified Bituminous Sheet Membrane:
 - 1. Thickness: 60 mils, 0.060 inch (1.5 mm), minimum.
 - 2. Sheet Width: 36 inches (0.914 m), minimum.
 - 3. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
 - 4. Products:
 - a. W. R. Meadows, Inc; MEL-ROL: www.wrmeadows.com/#sle.

2.04 ACCESSORIES

- A. Seaming Materials: As recommended by membrane manufacturer.
- B. Sealant for Cracks and Joints in Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
- C. Protection Board: Provide type capable of preventing damage to waterproofing due to backfilling and construction traffic.
 - 1. Products:
 - a. W. R. Meadows, Inc; Protection Course: www.wrmeadows.com/#sle.
- D. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.

1. Composition: Dimpled polystyrene, polyethylene, or polypropylene core; polypropylene filter fabric.
2. Thickness: As indicated on drawings.
3. Products:
 - a. W. R. Meadows, Inc; Mel-Drain 5012: www.wrmeadows.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting work.
- B. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- B. Roll out membrane and minimize wrinkles and bubbles.
- C. Overlap edges and ends, minimum 3 inches (76 mm), seal permanently waterproof by method recommended by manufacturer and apply uniform bead of sealant to joint edge.
- D. Reinforce membrane with multiple thicknesses of membrane material over joints, whether joints are static or dynamic.
- E. Weather lap joints on sloped substrate in drainage direction, and seal joints and seams.
- F. Flexible Flashings: Seal items penetrating through waterproofing membrane with flexible flashings.
- G. Seal membrane and flashings to adjoining surfaces.

3.03 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

- A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward; scribe and cut boards around projections, penetrations, and interruptions.
- B. Place protection board directly against membrane; butt joints, and scribe and cut boards around projections, penetrations, and interruptions.
- C. Adhere drainage panel and protection board to substrate with compatible adhesive.

END OF SECTION

SECTION 074113 METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal roof panel system of preformed steel panels.

1.02 RELATED REQUIREMENTS

- A. Section 051200 - Structural Steel Framing: Roof framing and purlins.
- B. Section 074213 - Metal Wall Panels: Preformed wall panels.
- C. Section 079200 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.
- D. Section 099113 - Exterior Painting: Field priming and painting roofing panels.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2022.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- F. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2005 (Reapproved 2017).
- G. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2018.
- H. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Summary of test results, indicating compliance with specified requirements.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Specimen warranty.
- C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
 - 1. Show work to be field-fabricated or field-assembled.
 - 2. Include structural analysis signed and sealed by qualified structural engineer, indicating compliance of roofing system to specified loading conditions.
- D. Verification Samples: For each roofing system specified, submit samples of minimum size 12 inches (305 mm) square, representing actual roofing metal, thickness, profile, color, and texture.
- E. Manufacturer's qualification statement.

- F. Installer's qualification statement.
- G. Test Reports: Indicate compliance of metal roofing system to specified requirements.
- H. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section and with at least three years of documented experience.
 - 1. Accredited by IAS in accordance with IAS AC472.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Provide strippable plastic protection on prefinished roofing panels for removal after installation.
- C. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 FIELD CONDITIONS

- A. Do not install metal roof panels, eave protection membrane or underlayment when surface, ambient air, or wind chill temperatures are below 45 degrees F (7 degrees C).

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.
- C. Special Warranty: Provide 2-year warranty for weathertightness of roofing system, including agreement to repair or replace metal roof panels that fail to keep out water commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Architectural Metal Roof Panel Manufacturers:
 - 1. Varco Pruden Buildings; SSR: www.vp.com
 - 2. Fabral; Stand N Seam: www.fabral.com/#sle.
 - 3. Petersen Aluminum Corporation; PAC-150 180 Degree Double Lock: www.pac-clad.com/#sle.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Metal Soffit Panels Manufacturers:
 - 1. Varco Pruden Buildings; FP-12: www.vp.com
 - 2. Fabral; Quad-4: www.fabral.com/#sle.
 - 3. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Metal Roof Panels: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for compliance with the following minimum standards:
 - 1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed L/180 of span length(L) when tested in accordance with ASTM E1592.

2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.
3. Wind Uplift: Class 90 wind uplift resistance of UL 580.
4. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F (56 degrees C).

2.03 METAL ROOF PANELS

- A. Metal Roof Panels: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.
- B. Metal Panels: Factory-formed panels with factory-applied finish.
 1. Steel Panels:
 - a. Aluminum-zinc alloy-coated steel complying with ASTM A792/A792M; minimum AZ50 (AZM150) coating.
 - b. Steel Thickness: Minimum 22 gauge, 0.0293 inch (0.85 mm).
 2. Texture: Smooth.
 3. Length: Full length of roof slope, without lapped horizontal joints.
 4. Width: Maximum panel coverage of 24 inches (610 mm).
- C. Metal Soffit Panels:
 1. Profile: Style as indicated, with venting provided.
 2. Material: Precoated steel sheet, 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
 3. Color: As indicated.

2.04 ATTACHMENT SYSTEM

- A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.05 SECONDARY FRAMING

- A. Miscellaneous Secondary Framing: Light gauge steel framing incidental to structural supports; fabricated from steel sheet.
- B. Framing Material: ASTM A1011/A1011M Designation SS steel sheet.
 1. Profile: Manufacturer's standard cee, zee, asymmetrical zee, hat channel, plain channel, single slope eave strut, double slope eave strut, and angle.
 2. Thickness: 12 gauge, 0.1046 inch (2.657 mm).
 3. Finish: Galvanized per ASTM A653/A653M, G90.
- C. Framing Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.

2.06 FABRICATION

- A. Panels: Provide factory or field fabricated panels with applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.
- B. Joints: Provide captive gaskets, sealants, or separator strips at panel joints to ensure weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

2.07 FINISHES

- A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat metal coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss to match sample.

2.08 ACCESSORIES

- A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.
- B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.
- C. Sealants:
 - 1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
 - 2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
 - 3. Seam Sealant: Factory-applied, non-skinning, non-drying type.
- D. Thermal Insulation: Provide two layers of batt insulation. First layer (R-19) is parallel to the purlins and supported by a system. Second layer (R-10) is laid on top of purlins, with (R-5) rigid insulation thermal blocks, as specified by 2022 Building Energy Efficiency Standards, 2022 CEC. type, faced with white, flexible, non-dusting vapor retarder tested for maximum flame spread index of 50, per ASTM E84; for installation using spacer blocks.
 - 1. Thickness: As indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to ensure that completed roof will be free of leaks.
- B. Remove protective film from surface of roof panels immediately prior to installation; strip film carefully to avoid damage to prefinished surfaces.
- C. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by metal roof panel manufacturer.
- D. At locations where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

- A. Overall: Install roofing system in accordance with approved shop drawings and metal roof panel manufacturer's instructions and recommendations, as applicable to specific project conditions; securely anchor components of roofing system in place allowing for thermal and structural movement.
 - 1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
 - 2. Minimize field cutting of panels. Where field cutting is required, use methods that will not distort panel profiles. Use of torches for field cutting is prohibited.
- B. Accessories: Install necessary components that are required for complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.
- C. Roof Panels: Install metal roof panels in accordance with manufacturer's installation instructions, minimizing transverse joints except at junction with penetrations.

- D. Insulation: Install insulation between roof covering and supporting members to present a neat appearance; fold, staple, and tape seams unless otherwise approved by Architect.

3.04 CLEANING

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

END OF SECTION

SECTION 074213 METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured metal panels for exterior wall panels, soffit panels, and subgirt framing assembly, with insulation, related flashings, and accessory components.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Wall panel substrate.
- B. Section 072100 - Thermal Insulation.
- C. Section 079200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.
- D. Section 092116 - Gypsum Board Assemblies: Wall panel substrate.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2022.
- D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- F. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
 - 1. Physical characteristics of components shown on shop drawings.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions and recommendations.
- C. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, and methods of anchorage.
- D. Samples: Submit two samples of wall panel and soffit panel, 12 inches by 12 inches (305 mm by 305 mm) in size illustrating finish color, sheen, and texture.
- E. Test Reports: Submit test report verifying compliance with NFPA 285 for previously-tested exterior wall assembly.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Testing agency's qualification statement.
- I. Warranty Documentation for Installation of Building Rainscreen Assembly: Submit installer warranty and ensure that forms have been completed in Owner's name and registered with installer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience and certified by the panel supplier for fabrication of wall panel system.
- B. Installer Qualifications: Company specializing in installing products specified in this section with minimum three years of documented experience and approved by manufacturer.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- C. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.
- D. Prevent contact with materials that may cause discoloration or staining of products.

1.07 FIELD CONDITIONS

- A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.
- C. Special Warranty: Provide 2-year warranty covering water tightness and integrity of seals of metal wall panels. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A.
 - 1. Metal Wall Panels - Concealed Fasteners:
 - a. Varco Pruden Buildings; Tech Four Wall Panel and ImpresaClad: www.vp.com
 - b. Fabral: www.fabral.com/#sle.
 - c. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 - 2. Metal Soffit Panels:
 - a. Varco Pruden Buildings; FP-12 Soffit Panel: www.vp.com
 - b. Fabral: www.fabral.com/#sle.
 - c. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL WALL PANEL SYSTEM

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
 - 1. Provide exterior wall panels, soffit panels, and subgirt framing assembly.
 - 2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
 - 3. Design Pressure: In accordance with applicable codes.
 - 4. Fire Performance: Tested in accordance with, and complying with acceptance criteria of NFPA 285.
 - 5. Maximum Allowable Deflection of Panel: $L/180$ for length(L) of span.
 - 6. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when

- subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
- 7. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
- 8. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
- 9. Corners: Factory-fabricated in one continuous piece with minimum 2-inch (51 mm) returns.
- B. Exterior Wall Panels:
 - 1. Profile: Vertical and horizontal, as indicated; style as indicated.
 - 2. Side Seams: Double-interlocked, tight-fitting, sealed with continuous gaskets.
 - 3. Material: Precoated steel sheet, 20 gauge, 0.0359 inch (0.91 mm) minimum thickness.
 - 4. Panel Width: 16 inches (406.4 mm).
 - 5. Color: As indicated on drawings.
- C. Soffit Panels:
 - 1. Profile: Style as indicated, with venting provided.
 - 2. Material: Precoated steel sheet, 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
 - 3. Color: As selected by Architect from manufacturer's standard line.
- D. Subgirt Framing Assembly:
 - 1. 16 gauge, 0.0598 inch (1.52 mm) thick formed non-precoated steel sheet.
- E. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
- F. Expansion Joints: Same material, thickness and finish as exterior sheets; 22 gauge, 0.034 inch (0.85 mm) thick; manufacturer's standard brake formed type, of profile to suit system.
- G. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- H. Anchors: Galvanized steel.

2.03 MATERIALS

- A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- B. Insulation: ASTM C665, Type II, Class A, mineral-fiber blanket.
 - 1. Thickness: As indicated on drawings
 - 2. Thermal Resistance: Provide two layers of batt insulation. First layer (R-13) placed parallel to wall framing and supported by an insulation support system. Second layer (R-10) laid between wall framing and exterior wall panels, with (R-5) rigid insulation thermal blocks, as specified by 2022 Building Energy Efficiency Standards, 2022 CEC. Type faced with white, flexible, non-dusting vapor retarder tested for a maximum flame spread index of 50, per ASTM E84: for insulation using spacer blocks.

2.04 FINISHES

- A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.
- B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.
- C. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat metal coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss to match sample.

2.05 ACCESSORIES

- A. Cladding Support Clips: Thermally-broken, thermal spacer clips for support of cladding z-girts, angles, channels, and other framing.

1. Thermal Spacer Clip: Pultruded glass fiber and thermoset polyester resin clip; 3/16 inch (4.8 mm) thick at top, base, and web.
 2. Clip Depth: As indicated on drawings.
- B. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.

3.02 PREPARATION

- A. Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane, and spaced at intervals indicated.
- B. Protect surrounding areas and adjacent surfaces from damage during execution of this work.

3.03 INSTALLATION

- A. Install panels on walls and soffits in accordance with manufacturer's instructions.
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint; allow to dry prior to wall panel installation.
- C. Fasten panels to structural supports; aligned, level, and plumb.
- D. Locate joints over supports.
- E. Lap panel ends 2 inches (51 mm), minimum.
- F. Use concealed fasteners unless otherwise indicated by Architect.
- G. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.04 TOLERANCES

- A. Offset From True Alignment Between Adjacent Members Abutting or In Line: 1/16 inch (1.6 mm), maximum.
- B. Variation from Plane or Location As Indicated on Drawings: 1/4 inch (6.4 mm), maximum.

3.05 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove site cuttings from finish surfaces.
- C. Remove protective material from wall panel surfaces.

3.06 PROTECTION

- A. Protect metal wall panels until completion of project.
- B. Touch-up, repair, or replace damaged wall panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 076200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, sheet metal roofing, exterior penetrations, and other items indicated in Schedule.

1.02 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- D. CDA A4050 - Copper in Architecture - Handbook; Current Edition.
- E. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 3 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch (0.61 mm) thick base metal.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch (0.61 mm) thick base metal, shop pre-coated with PVDF coating.
 - 1. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
- C. Anodized Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 20 gauge, 0.032 inch (0.81 mm) thick; clear anodized finish.

2.02 EXTERIOR PENETRATION FLASHING PANELS

- A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch (0.38 mm).

3.03 INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

END OF SECTION

**SECTION 077123
MANUFACTURED GUTTERS AND DOWNSPOUTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

- A. Section 133419: Metal Building Systems

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on prefabricated components.
- C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gutters and Downspouts:
 - 1. By Pre-Engineered Building Manufacturer

2.02 MATERIALS

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that surfaces are ready to receive work.

3.02 PREPARATION

3.03 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Slope gutters , 0.5 percent minimum.
- C. Set splash pans under downspouts. Secure in place with _____ .

END OF SECTION

**SECTION 077200
ROOF ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Snow guards.
- B. Roof snow and ice melting system.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
- D. Warranty Documentation:
 - 1. Submit manufacturer warranty.
 - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store products under cover and elevated above grade.

1.04 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 SNOW GUARDS

- A. Fence Type Snow Guard: Continuous snow guard; manufacturer's standard pipe, bar, channel, or solid rod, set in brackets or posts, with optional plates and metal trim to match roof.
 - 1. Solid Rod: Aluminum, mill finish.
 - a. Outside Diameter: 3/8 inch (9.5 mm).
 - 2. Supplemental Plates and Clips: Attached to horizontal component; match finish of pipe, tube, rod, or channel.
 - 3. Clamps for Standing Seam Roof: Aluminum clamps attached to standing seams of roof panels; for attachment of fence type snow guard.
 - a. Seam Profile: Selected by Architect from manufacturer's standard range; match profile of metal roof.
 - b. Finish: Mill finish.
 - 4. Products:
 - a. Alpine SnowGuards; ASG4025-AL Standing Seam Two-Pipe Snow Guard: www.alpinesnowguards.com/#sle.
 - b. Rocky Mountain Snow Guards, Inc; No-Flash 2 Pipe or 3 Pipe Snow Fence Bracket: www.rockymountainsnowguards.com/#sle.
 - c. Or Approved Equal.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.02 ROOF SNOW AND ICE MELTING SYSTEMS

- A. Roof Snow and Ice Melting Systems: Self-regulating heating cable system for roof and gutter applications to melt snow and ice.
 - 1. Application: Standing seam metal roofing system with gutter.
 - 2. Provide cable spacing and number of heating circuits and accessories in accordance with manufacturer's written requirements.
 - 3. Supply Voltage: 110-120 VAC with ground-fault protection as required by authorities having jurisdiction (AHJ).
 - 4. Products:
 - a. Thermon, Inc: www.thermon.com/#sle.
 - b. Or Approved Equal.
 - c. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

END OF SECTION

SECTION 079200 JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.

1.02 REFERENCE STANDARDS

- A. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- B. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- D. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
- E. Installer's qualification statement.
- F. Executed warranty.

1.04 QUALITY ASSURANCE

- A. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
 - 1. Adhesion Testing: In accordance with ASTM C794.
 - 2. Compatibility Testing: In accordance with ASTM C1087.
 - 3. Allow sufficient time for testing to avoid delaying the work.
 - 4. Deliver sufficient samples to manufacturer for testing.
 - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Nonsag Sealants:
 - 1. Dow: www.dow.com/#sle.
 - 2. Henry Company: www.henry.com/#sle.

3. Hilti, Inc: www.hilti.com/#sle.
4. Pecora Corporation: www.pecora.com/#sle.
5. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
6. Or Approved Equal.
7. Substitutions: See Section 016000 - Product Requirements.

2.02 JOINT SEALANTS - GENERAL

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

**SECTION 081113
HOLLOW METAL DOORS AND FRAMES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Fire-rated hollow metal doors and frames.

1.02 REFERENCE STANDARDS

- A. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.
- B. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.
- E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- F. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- G. UL (DIR) - Online Certifications Directory; Current Edition.
- H. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 - 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 3. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 - 4. Titan Metal Products, Inc; Builders Series 20 - 90 Minute Doors: www.titanmetalproducts.com/#sle.
 - 5. Or Approved Equal.
 - 6. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Fire-Rated Doors:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
 - 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - 3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.
 - 4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Door Frames, Fire-Rated: Knock-down type.
 - 1. Fire Rating: Same as door, labeled.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Install door hardware as specified in Section 087100.

3.04 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

**SECTION 083323
OVERHEAD COILING DOORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior coiling doors.
- B. Electric operators and control stations.
- C. Wiring from electric circuit disconnect to operators and control stations.

1.02 REFERENCE STANDARDS

- A. ITS (DIR) - Directory of Listed Products; Current Edition.
- B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- D. UL (DIR) - Online Certifications Directory; Current Edition.
- E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide general construction, electrical equipment, and component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Samples: Two slats, illustrating shape, color and finish texture.
- E. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
- F. Installer's qualification statement.
- G. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.
- H. Specimen warranty.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience.
- C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified and indicated.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide five-year manufacturer warranty for three-ply multifilament polyester fabric curtain. Complete forms in Owner's name and register with manufacturer.
- C. Manufacturer Warranty: Provide 2-year manufacturer warranty for roller shaft counterbalance assembly. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Overhead Coiling Doors:
 - 1. Overhead Door; 627 Insultaed Storm Door: www.ohd.com.
 - 2. Cornell Iron Works, Inc; Thermiser Max: www.cornelliron.com/#sle.
 - 3. The Cookson Company: www.cooksondoor.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS AND COMPONENTS

- A. Metal Curtain Construction: Interlocking slats.
 - 1. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
 - 2. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
- B. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.

2.03 ELECTRIC OPERATION

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
 - 1. Provide interlock switches on motor operated units.
- B. Electric Operators:
 - 1. Mounting: Side mounted.
 - 2. Motor Enclosure:
 - 3. Motor Rating: 3/4 HP (560 W); continuous duty.
 - 4. Motor Voltage: 120 volts, single phase, 60 Hz.
 - 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
 - 6. Controller Enclosure: NEMA EN 10250, Type 4.
 - 7. Opening Speed: 12 inches per second (300 mm/sec).
 - 8. Brake: Manufacturer's standard type, activated by motor controller.
 - 9. Manual override in case of power failure.
 - 10. See Section 260583 for electrical connections.
- C. Control Station: Provide standard three button, 'Open-Close-Stop' momentary-contact control device for each operator complying with UL 325.
 - 1. 24 volt circuit.
 - 2. Surface mounted, at interior door jamb.
 - 3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
 - a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.
- D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that adjacent construction is suitable for door installation.
- B. Verify that electrical services have been installed and are accessible.
- C. Verify that door opening is plumb, header is level, and dimensions are correct.
- D. Notify Architect of any unacceptable conditions or varying dimensions.

- E. Commencement of installation indicates acceptance of substrate and door opening conditions.

3.02 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 260583.
- F. Complete wiring from disconnect to unit components.

3.03 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.6 mm).
- C. Maximum Variation From Level: 1/16 inch (1.6 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet (3.2 mm per 3 m) straight edge.

3.04 ADJUSTING

- A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

END OF SECTION

**SECTION 083613
SECTIONAL DOORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Overhead sectional doors, electrically operated.
- B. Operating hardware and supports.
- C. Electrical controls.

1.02 REFERENCE STANDARDS

- A. ITS (DIR) - Directory of Listed Products; Current Edition.
- B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL (DIR) - Online Certifications Directory; Current Edition.
- F. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- C. Product Data: Show component construction, anchorage method, and hardware.
- D. Samples: Submit two panel finish samples, illustrating color and finish.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction, as suitable for purpose specified.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for electric motor and transmission.
- D. Provide five year manufacturer warranty for electric operating equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sectional Doors:
 - 1. Overhead Door; Thermacore doors: www.ohd.com
 - 2. Cornell Ironworks; Thermiser Max: www.Cornelliron.com
 - 3. Or Approved Equal.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.02 COMPONENTS

- A. Track: Rolled galvanized steel, 0.090 inch (2.3 mm) minimum thickness; 2 inch (50 mm) wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch (6 mm) thick.
- B. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.
 - 1. For Manual Operation: Requiring maximum exertion of 25 lbs (110 N) force to open.
- C. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.
- D. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.
- E. Head Weatherstripping: EPDM rubber seal, one piece full length.
- F. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.
- G. Lock: Inside center mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior and exterior handle.

2.03 ELECTRIC OPERATION

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
 - 1. Provide interlock switches on motor operated units.
- B. Electric Operators:
 - 1. Mounting: Side mounted on cross head shaft.
 - 2. Motor Enclosure:
 - 3. Motor Rating: 3/4 hp (560 W); continuous duty.
 - 4. Motor Voltage: 120 volts, single phase, 60 Hz.
 - 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
 - 6. Controller Enclosure: NEMA EN 10250, Type 1.
 - 7. Opening Speed: 12 inches per second (300 mm/s).
 - 8. Brake: Adjustable friction clutch type, activated by motor controller.
 - 9. Manual override in case of power failure.
 - 10. Refer to Section 260583 for electrical connections.
- C. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated; enclose terminal lugs in terminal box sized to comply with NFPA 70.
- D. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
 - 1. 24 volt circuit.
 - 2. Surface mounted, at interior door jamb.
 - 3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
 - a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.
- E. Safety Edge: Located at bottom of sectional door panel, full width; electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object; hollow neoprene covered to provide weatherstrip seal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- B. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION

- A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.
- B. Apply primer to wood frame.

3.03 INSTALLATION

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Anchor assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware.
- E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.04 TOLERANCES

- A. Maximum Variation from Plumb: 1/16 inch (1.5 mm).
- B. Maximum Variation from Level: 1/16 inch (1.5 mm).
- C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch (3 mm) from 10 ft (3 m) straight edge.
- D. Maintain dimensional tolerances and alignment with adjacent work.

3.05 ADJUSTING

- A. Adjust door assembly for smooth operation and full contact with weatherstripping.

3.06 CLEANING

- A. Clean doors and frames and glazing.
- B. Remove temporary labels and visible markings.

3.07 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.
- B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION

SECTION 087100 DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood, aluminum, and hollow metal doors.
- B. Electrically operated and controlled hardware.
- C. Thresholds.
- D. Weatherstripping and gasketing.

1.02 REFERENCE STANDARDS

- A. BHMA A156.1 - Standard for Butts and Hinges; 2021.
- B. BHMA A156.2 - Bored and Preassembled Locks and Latches; 2017.
- C. BHMA A156.3 - Exit Devices; 2020.
- D. BHMA A156.4 - Door Controls - Closers; 2019.
- E. BHMA A156.6 - Standard for Architectural Door Trim; 2021.
- F. BHMA A156.13 - Mortise Locks & Latches Series 1000; 2017.
- G. BHMA A156.16 - Auxiliary Hardware; 2018.
- H. BHMA A156.18 - Materials and Finishes; 2020.
- I. BHMA A156.21 - Thresholds; 2019.
- J. BHMA A156.22 - Standard for Gasketing; 2021.
- K. BHMA A156.31 - Electric Strikes and Frame Mounted Actuators; 2019.
- L. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
 - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
 - 2. Provide complete description for each door listed.
- D. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
 - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
 - 2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.

3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.
- B. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer's Warranty: Provide warranty against defects in material and workmanship for period indicated. Complete forms in Owner's name and register with manufacturer.
 1. Closers: Five years, minimum.
 2. Exit Devices: Three years, minimum.
 3. Locksets and Cylinders: Three years, minimum.
 4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Provide door hardware products that comply with the following requirements:
 1. Applicable provisions of federal, state, and local codes.

2.02 HINGES

- A. Manufacturers:
 1. McKinney; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Bommer Industries, Inc: www.bommer.com/#sle.
 3. Hager Companies: www.hagerco.com/#sle.
 4. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
 5. Or Approved Equal.
 6. Substitutions: See Section 016000 - Product Requirements.
- B. Hinges: Comply with BHMA A156.1, Grade 1.
 1. Provide hinges on every swinging door.
 2. Provide following quantity of butt hinges for each door:
 - a. Doors up to 60 inches (1.5 m) High: Two hinges.
 - b. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
 - c. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.

2.03 EXIT DEVICES

- A. Manufacturers:
 1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
 3. Von Duprin, an Allegion brand: www.allegion.com/us/#sle.

- B. Exit Devices: Comply with BHMA A156.3, Grade 1.
 - 1. Lever design to match lockset trim.
 - 2. Provide cylinder with cylinder dogging or locking trim.
 - 3. Provide exit devices properly sized for door width and height.
 - 4. Provide strike as recommended by manufacturer for application indicated.
 - 5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.04 ELECTRIC STRIKES

- A. Manufacturers:
 - 1. Adams Rite, HES, or Securitron; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Pamex, Inc; Electric Strikes: www.pamexinc.com/#sle.
- B. Electric Strikes: Comply with BHMA A156.31, Grade 1.
 - 1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
 - 2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.

2.05 CYLINDRICAL LOCKS

- A. Manufacturers:
 - 1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Schlage, an Allegion brand: www.allegion.com/us/#sle.
 - 3. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.
 - 1. Bored Hole: 2-1/8 inch (54 mm) diameter.
 - 2. Latchbolt Throw: 1/2 inch (12.7 mm), minimum.
 - 3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
 - 4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
 - a. Finish: To match lock or latch.

2.06 MORTISE LOCKS

- A. Manufacturers:
 - 1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Schlage, an Allegion brand: www.allegion.com/us/#sle.
 - 3. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Mortise Locks: Comply with BHMA A156.13, Grade 1, Security, 1000 Series.
 - 1. Latchbolt Throw: 3/4 inch (19 mm), minimum.
 - 2. Deadbolt Throw: 1 inch (25.4 mm), minimum.
 - 3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
 - 4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
 - a. Finish: To match lock or latch.

2.07 DOOR PULLS AND PUSH PLATES

- A. Manufacturers:
 - 1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Hager Companies: www.hagerco.com/#sle.

3. Trimco: www.trimcohardware.com/#sle.
 4. Substitutions: See Section 016000 - Product Requirements.
- B. Door Pulls and Push Plates: Comply with BHMA A156.6.
1. Pull Type: Straight, unless otherwise indicated.
 2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
 - a. Edges: Beveled, unless otherwise indicated.
 3. Material: Aluminum, unless otherwise indicated.

2.08 CLOSERS

- A. Manufacturers; Surface Mounted:
1. Corbin Russwin, Norton, Rixson, Sargent, or Yale; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. DORMA USA, Inc; 7400 Series, 8600 Series, 8900 Series, and TS93: www.dorma.com/#sle.
 3. LCN, an Allegion brand: www.allegion.com/us/#sle.
 4. Or Approved Equal.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Closers: Comply with BHMA A156.4, Grade 1.
1. Type: Surface mounted to door.
 2. Provide door closer on each exterior door.

2.09 FLOOR STOPS

- A. Manufacturers:
1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Hager Companies: www.hagerco.com/#sle.
 3. Trimco: www.trimcohardware.com/#sle.
 4. Or Approved Equal.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Floor Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
1. Type: Manual hold-open, with pencil floor stop.
 2. Material: Aluminum housing with rubber insert.

2.10 THRESHOLDS

- A. Manufacturers:
1. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Hager Companies: www.hagerco.com/#sle.
 3. Reese Enterprises, Inc: www.reeseusa.com/#sle.
 4. Or Approved Equal.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Thresholds: Comply with BHMA A156.21.
1. Provide threshold at each exterior door, unless otherwise indicated.
 2. Type: Flat surface.
 3. Material: Aluminum.
 4. Threshold Surface: Fluted horizontal grooves across full width.
 5. Field cut threshold to profile of frame and width of door sill for tight fit.
 6. Provide non-corroding fasteners at exterior locations.

2.11 WEATHERSTRIPPING AND GASKETING

- A. Manufacturers:
1. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Hager Companies: www.hagerco.com/#sle.
 3. Reese Enterprises, Inc: www.reeseusa.com/#sle.

4. Or Approved Equal.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Weatherstripping and Gasketing: Comply with BHMA A156.22.
1. Head and Jamb Type: Adjustable.
 2. Door Sweep Type: Encased in retainer.
 3. Material: Aluminum, with brush weatherstripping.

2.12 FINISHES

- A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
1. Primary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
 2. Secondary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
 - a. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
- D. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING

- A. Adjust work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

- A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

END OF SECTION

SECTION 088000 GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing compounds.

1.02 REFERENCE STANDARDS

- A. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- B. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
- C. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- D. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
- E. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2020.
- F. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2020.
- G. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 12 by 12 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Glass Fabricators:
 - 1. Guardian Glass, LLC: www.guardianglass.com/#sle
 - 2. Vitro Architectural Glass (formerly PPG Glass) : www.vitroglazings.com/#sle.
 - 3. Viracon, Inc: www.viracon.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Float Glass Manufacturers:
 - 1. Guardian Glass, LLC: www.guardianglass.com/#sle.
 - 2. Pilkington North America Inc: www.pilkington.com/na/#sle.
 - 3. Vitro Architectural Glass (formerly PPG Glass); Solarban 70: www.vitroglazings.com/#sle.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 3. Glass thicknesses listed are minimum.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
 - 1. In conjunction with weather barrier related materials described in other sections, as follows:
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 INSULATING GLASS UNITS

- A. Insulating Glass Units: Types as indicated.
 - 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 - 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 - 3. Spacer Color: Black.
 - 4. Edge Seal:
 - a. Color: Black.
 - 5. Purge interpane space with dry air, hermetically sealed.
- B. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
 - 1. Applications: Exterior glazing unless otherwise indicated.
 - 2. Space between lites filled with air.
 - 3. Outboard Lite: Annealed float glass, 1/4 inch (6.4 mm) thick, minimum.
 - a. Tint: Gray.
 - 4. Inboard Lite: Annealed float glass, 1/4 inch (6.4 mm) thick, minimum.

- a. Tint: Clear.
- 5. Total Thickness: 1 inch (25.4 mm).
- 6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.41, nominal.
- 7. Visible Light Transmittance (VLT): 46 percent, nominal.
- 8. Solar Heat Gain Coefficient (SHGC): 0.26, nominal.

2.04 ACCESSORIES

- A. Concealed nonprogressive structural glass mounting system.
- B. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) by width of glazing rabbet space minus 1/16 inch (1.5 mm) by height to suit glazing method and pane weight and area.
- C. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- C. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- D. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.05 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 089100 LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Louvers, frames, and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 076200 - Sheet Metal Flashing and Trim.
- B. Section 233100 - HVAC Ducts and Casings: Ductwork attachment to louvers, and blank-off panels.

1.03 REFERENCE STANDARDS

- A. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2021, with Editorial Revision (2022).
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, and tolerances; head, jamb and sill details; blade configuration, screens, blank-off areas required, and frames.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Louvers:
 - 1. Airline Louvers: www.airlinelouvers.com/#sle.
 - 2. Airolite Company, LLC: www.airolite.com/#sle.
 - 3. Ruskin Company; Louvers: www.ruskin.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.02 LOUVERS

- A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

2.04 ACCESSORIES

- A. Insect Screen: 18 x 16 size aluminum mesh.
- B. Head and Sill Flashings: See Section 076200.
- C. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated.

3.02 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Coordinate with installation of flashings by others.
- C. Install louvers level and plumb.
- D. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- E. Secure louver frames in openings with concealed fasteners.
- F. Coordinate with installation of mechanical ductwork.

3.03 ADJUSTING

- A. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

3.04 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

END OF SECTION

**SECTION 092216
NON-STRUCTURAL METAL FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Requirements for structural, load-bearing, metal stud framing and exterior wall stud framing.
- B. Section 061000 - Rough Carpentry: Wall sheathing.
- C. Section 072100 - Thermal Insulation: Acoustic insulation.

1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
 - 1. CEMCO: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3. SCAFCO Corporation: www.scafco.com/#sle.
 - 4. Simpson Strong Tie: www.strongtie.com/#sle.
 - 5. Super Stud Building Products, Inc: www.buysuperstud.com/#sle.
 - 6. Or Approved Equal.
 - 7. Substitutions: See Section 016000 - Product Requirements.

2.02 FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: AISI S220; sheet steel, of size and properties necessary for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (L/240 at 240 Pa).
 - 1. Studs: C-shaped with flat faces.
 - 2. Runners: U-shaped, sized to match studs.

3. Ceiling Channels: C-shaped.
4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
- B. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
 1. Products:
 - a. Same manufacturer as other framing materials.
- C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code when evaluated in accordance with AISI S100.
 2. Material: ASTM A653/A653M steel sheet, SS Grade 50.
- D. Non-Loadbearing Framing Accessories:
 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
 3. Bracing and Bridging: ASTM A653/A653M G90 galvanized steel; for lateral bracing of wall studs with slots for engaging on-module studs.

2.03 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.
- C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING

- A. Extend partition framing to structure where indicated and to ceiling in other locations.
- B. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- C. Align and secure top and bottom runners at 24 inches (600 mm) on center.
- D. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- E. Align stud web openings horizontally.
- F. Secure studs to tracks using crimping method. Do not weld.
- G. Fabricate corners using a minimum of three studs.
- H. Install double studs at wall openings, door and window jambs, not more than 2 inches (50 mm) from each side of openings.
- I. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- J. Furring: Install at spacing and locations shown on drawings. Lap splices a minimum of 6 inches (150 mm).

3.03 CEILING AND SOFFIT FRAMING

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.

- C. Securely anchor hangers to structural members or embed them in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 72 inches (1 800 mm) on center, and not more than 6 inches (150 mm) from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- F. Place furring channels perpendicular to carrying channels, not more than 2 inches (50 mm) from perimeter walls, and rigidly secure. Lap splices securely.

3.04 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet (3 mm in 3 m).

END OF SECTION

**SECTION 099113
EXTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Allow 30 days for approval process, after receipt of complete samples by Architect.
- D. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - 2. PPG Paints: www.ppgpaints.com/#sle
 - 3. Behr Process Corporation: www.behr.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

2.03 PAINT SYSTEMS - EXTERIOR

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

- A. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

**SECTION 099123
INTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- D. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
- F. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
 - 2. MPI product number (e.g., MPI #47).
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
 - 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.

3. Label each container with color in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F (3 degrees C) above the dew point, or to damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F (10 degrees C) for interiors unless required otherwise by manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 2. PPG Paints: www.ppgpaints.com/#sle.
 3. Behr Process Corporation: www.behr.com/#sle
 4. Or Approved Equal.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

2.03 PAINT SYSTEMS - INTERIOR

- A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, aluminum, and acoustical ceilings.
 1. Two top coats and one coat primer.
 2. Top Coat Sheen:

- a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
 - b. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.
3. Primer: As recommended by top coat manufacturer for specific substrate.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
 1. Gypsum Wallboard: 12 percent.
 2. Plaster and Stucco: 12 percent.
 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Concrete:
 1. 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.
 2. Clean surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi (10,350 to 27,580 kPa) at 6 to 12 inches (150 to 300 mm). Allow to dry.
 3. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.
- F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.
- H. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- I. Galvanized Surfaces:
- J. Ferrous Metal:
 1. Solvent clean according to SSPC-SP 1.
 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 Commercial Blast Cleaning. Protect from corrosion until coated.
- K. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

**SECTION 107113.43
FIXED SUN SCREENS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Modular, shop fabricated, extruded aluminum sun screens to be mounted on structure provided by others.

1.02 REFERENCE STANDARDS

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- B. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2022.
- D. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2022.

1.03 SUBMITTALS

- A. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing all profiles, sections of all components, finishes, fastening details, and manufacturer's technical and descriptive data. Include field dimensions of openings and elevations on shop drawings.
- B. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.
- C. Sample of Louver: For review of shape only.

1.04 QUALITY ASSURANCE

- A. Designer Qualifications: Perform structural design under direct supervision of a Professional Engineer experienced in design of this type of work licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with no less than five years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section.
 - 1. With minimum five years of documented experience.
 - 2. Approved by manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site ready for erection.
- B. Package using methods that prevent damage during shipping and storage on site.
- C. Store materials under cover and elevated above grade.

1.06 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Sun Screens: Correct defective work within a one year period after Date of Substantial Completion.
- C. Finish Warranty: Provide manufacturer's one year warranty on factory finish against cracking, peeling, and blistering.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fixed Aluminum Sun Screens:
 - 1. Arcadia, Inc; Brise Soleil -BSD008: www.arcadiainc.com/#sle.

2. Architectural Grilles & Sunshades, Inc: www.agsshade.com/#sle.
3. Construction Specialties: www.C-Sgroup.com
4. Industrial Louvers, Inc: www.industriallouvers.com/#sle.
5. Metalwerks; Sunshades: www.metalwerksusa.com/#sle.
6. Or Approved Equal.
7. Substitutions: See Section 016000 - Product Requirements.

2.02 SUN SCREENS

- A. Aluminum Sun Screens: Shop fabricated, shop finished, extruded aluminum outriggers, louvers, and fascia, free of defects impairing strength, durability or appearance.
 1. Configuration: As indicated on drawings.
 2. Louver Type: Flat Bar.
 3. Sun Screen Angle: 90 degrees from horizontal.
 4. Outrigger Shape: OPG1550.
 5. Design Criteria: Design and fabricate to resist the following loads without failure, damage, or permanent deflection:
 - a. See structural drawings for wind and other load information
 - b. Thermal Movement: Plus/minus 1/8 inch (3.175 mm), maximum.
 6. Sizes: As indicated on drawings.
 7. Provide a complete system ready for erection at project site.

2.03 MATERIALS

- A. Aluminum Coated Steel Sheet: ASTM A792/A792M.
- B. Concealed Structural Supports: Aluminum, or steel coated for corrosion resistance and dissimilar metal isolation.
- C. Fasteners: ASTM F593 stainless steel or ASTM A307 carbon steel.

2.04 FINISHES

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.
- B. Finish Color: AB7 Standard Dark Bronze.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that dimensions of supporting structure are within plus/minus 1/8 inch (3.175 mm) of dimensions indicated on shop drawings.
- C. Verify that all adjacent painting, roofing, masonry work, and other work that might damage sun screen finish has been completed prior to installation of sun screens.
- D. Do not install until after all adjacent painting, roofing and masonry have been completed.
- E. Do not proceed with installation until all conditions are satisfactory.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's installation instructions.
- B. Set units level, plumb, with uniform joints, and aligned with building elements.
- C. Separate dissimilar metals using concealed bituminous paint or non-absorbent gasket.
- D. Anchor units to structure as indicated on drawings.
- E. Do not cut or trim aluminum members without approval of manufacturer; do not install damaged members.

3.03 TOLERANCES

- A. Maximum Variation from Level: Plus/Minus 1/8 inch (3.175 mm).

3.04 PROTECTION

- A. Protect units after installation to prevent damage due to other work until Date of Substantial Completion.

END OF SECTION

SECTION 107316.13 METAL CANOPIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Attached metal canopies.

1.02 RELATED REQUIREMENTS

- A. Section 099600 - High-Performance Coatings: Finish coating.

1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- C. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2022.
- D. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.
- E. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).
- G. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- H. ITS (DIR) - Directory of Listed Products; Current Edition.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit product data sheets, including material descriptions and finishes, and preparation instructions and recommendations.
- C. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing profiles, sections of components, finishes, and fastening details.
- D. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.
- E. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver materials to project site ready for erection.
- C. Package using methods that prevent damage during shipping and storage on site.
- D. Store materials under cover and elevated above grade.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Metal Canopies: Correct defective work within a two year period after Date of Substantial Completion.
- C. Finish Warranty: Provide manufacturer's one year warranty on factory finish against cracking, peeling, and blistering.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Canopies:
 - 1. Mapes Canopies: www.mapes.com
 - 2. Austin Mohawk, Inc: www.austinmohawk.com/#sle.
 - 3. Or Approved Equal.
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL CANOPIES

- A. Shop Fabricated Aluminum Canopy
- B. Configuration: Layout and dimensions, column layout, canopy clearance, fascia profile, and roof covering design as indicated on drawings.
 - 1. Installation: Cantilever-mounted to building structure with tension members.
- C. Performance Requirements:
 - 1. Design and fabricate metal canopy system to resist wind, snow, live, and seismic loads without failure, damage, or permanent deflection in accordance with ASCE 7:
 - a. Loads: As indicated on drawings.
 - 2. Electrical Components, Devices, and Accessories: Listed and labeled by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction and installed in compliance with NFPA 70, and marked for intended application.

2.03 SHOP FABRICATION

- A. Provide a complete system ready for erection at project site.
- B. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.
- C. Weld steel members in accordance with AWS D1.1/D1.1M.
- D. Weld aluminum members in accordance with AWS D1.2/D1.2M.
- E. Fabricate connections for bolt, nut, and washer connectors.

2.04 FINISHES

- A. Structural Steel Framing:
 - 1. Shop Primer: Rust-inhibitive red oxide.
 - 2. Finish Coating: As specified in Section 099600.
- B. Aluminum Framing and Decking:

2.05 ACCESSORIES

- A. Structural Bolts: ASTM F3125/F3125M, Grade A325, minimum 3/4 inch (19 mm) diameter.

- B. Trim, Closure Pieces, and Flashings: Same material, thickness and finish as sheet metal decking; factory-fabricated to required profiles.
- C. Fasteners, Non-Structural: ASTM F593 stainless steel or ASTM A307 carbon steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that foundation, electrical utilities, and placed anchors are in correct position.
- C. Do not proceed with installation until all conditions are satisfactory.

3.02 INSTALLATION - FRAMING

- A. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation.
- B. Set column base plates with non-shrink grout to achieve full plate bearing.
- C. Fasten columns to anchor bolts.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 INSTALLATION - CANOPY COVERING

- A. Install in accordance with manufacturer's instructions.
- B. Fasten metal decking to metal support members, aligned level and plumb.
- C. Install fascia panels, trim, and flashing.
- D. Separate dissimilar metals using concealed bituminous paint.
- E. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 TOLERANCES

- A. Maximum Variation from Level: Plus/Minus 1/8 inch (3.175 mm).

3.05 PROTECTION

- A. Protect canopy after installation to prevent damage due to other work until Date of Substantial Completion.

END OF SECTION

SECTION 118129 FACILITY FALL PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof anchors.
- B. Horizontal lifeline systems.
- C. Ladder safety systems.

1.02 DEFINITIONS

- A. Anchorage: A secure connecting point or a terminating component of a fall protection system or rescue system capable of safely supporting the impact forces applied by a fall protection system or anchorage subsystem.
- B. Anchorage Connector: A component or subsystem that functions as an interface between the anchorage and a fall protection, work positioning, rope access, or rescue system for the purpose of coupling the system to the anchorage.
- C. Fall Restraint System: A system designed to keep you from getting close enough to the fall hazard to fall, typically including an anchor point or series of anchor points, a safety lanyard or self-retracting lifeline, and a harness.
- D. Lifeline: A component of a fall protection system consisting of a flexible line designed to hang vertically, a vertical lifeline, or connecting to anchorages or anchorage connectors at both ends to span horizontally, a horizontal lifeline.

1.03 REFERENCE STANDARDS

- A. ANSI/ASSP Z359.18 - Safety Requirements for Anchorage Connectors for Active Fall Protection Systems; 2017, with Errata (2021).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- E. ASTM A1023/A1023M - Standard Specification for Carbon Steel Wire Ropes for General Purposes; 2021.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- G. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.
- H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- I. CAL (OSHA) TITLE 8 SC 7 - California Code of Regulations, Title 8, Subchapter 7, General Industry Safety Orders; 2021.
- J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of roof anchors with PEMB to verify installation will result in a warrantable building envelope.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.
- C. Product Data: Material, equipment, and fixture lists. Manufacturer's catalog data indicating the sizes, descriptions, capacities, test certifications, and other descriptive data showing in sufficient detail that product complies with contract requirements. Equipment and performance data including but not limited to lifeline anchors, safety tieback anchors, and lifeline cable.
- D. Shop Drawings: Installation details: plan showing locations and types of anchorage points for personal fall protection systems and building maintenance equipment.
 - 1. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.
 - 2. Indicate anchorage details and quantity, diameter, and depth of penetration of anchors.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated within the previous 12 months.
- G. Designer's qualification statement.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 ROOF ANCHORS

- A. Manufacturers:
 - 1. Guardian Fall Protection; _____: www.guardianfall.com/#sle.
 - 2. Pro-Bel Enterprises Ltd; _____: www.pro-bel.ca/#sle.
 - 3. Summit Anchor Company; _____: www.summitanchor.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Application:
 - 1. CAL-OSHA one person PPE anchor.
 - 2. CAL-OSHA window washing tieback anchor.
- C. Description:
 - 1. Roof anchorage points for personal fall protection systems; used exclusively for employee fall protection and independent of any anchorage used to suspend employees or platforms on which employees work.
 - a. Anchor Type per ANSI/ASSP Z359.18: Type T.
- D. Structural Performance: Provide safety tieback anchors capable of withstanding design loads as required by governing regulations and codes.
- E. Design Criteria: Fall protection anchors.
 - 1. Comply with CAL (OSHA) TITLE 8 SC 7 requirements for anchors used in personal fall protection systems.
- F. Design Criteria: Primary suspension lines.
 - 1. Comply with CAL (OSHA) TITLE 8 SC 7 requirements for anchors used in window washing applications.
- G. Anchors:
 - 1. Type: Vertical foam-filled steel pier and baseplate with galvanized forged steel loop.
 - a. Loop Diameter: 1-3/8 inch (35 mm).
 - b. Pier:
 - 1) Height: 24 inches (610 mm).
 - 2) Wall Thickness: Schedule 40.

- 3) Material: Hot-dip galvanized steel pipe.
- 4) Foam: Polyurethane. ASTM E84 Class I.
- c. Flat baseplate, factory-welded.
 - 1) Size: 10 inches (254 mm) square.
 - 2) Thickness: 3/8 inch (9.5 mm).
 - 3) Material: Hot-dip galvanized steel.

H. Anchor Installation:

2.02 HORIZONTAL LIFELINE SYSTEMS

- A. Manufacturers:
 - 1. Guardian Fall Protection; _____: www.guardianfall.com/#sle.
 - 2. Pro-Bel Enterprises Ltd; _____: www.pro-bel.ca/#sle.
 - 3. Super Anchor Safety; _____: www.superanchor.com/#sle.
 - 4. Or Approved Equal.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Description: A system comprised of a flexible line such as wire rope or cable, with connectors at both ends to secure it horizontally between two anchorages or anchorage connectors.
- C. Structural Performance: Provide fall-arresting lifeline systems capable of withstanding design loads as required by governing regulations and codes.
- D. Design Criteria:
- E. Wire Rope: ASTM A1023/A1023M, 7x7 galvanized wire , 5/16 inch (8 mm) diameter.

2.03 MATERIALS - STEEL

- A. Structural Steel Sections: ASTM A36/A36M.
- B. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized in accordance with ASTM A153/A153M where connecting galvanized hardware components.
- C. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATION

- A. Fabricate work true to dimension, square, plumb, level, and free from distortion or defects detrimental to appearance and performance.

2.05 FINISHES

- A. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
 - 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install anchorage and fasteners in accordance with shop drawings and manufacturer's recommendations to obtain allowable working loads published in product literature and in accordance with this specification.
- B. Seal roof penetrations at anchors with pre-molded pipe flashing, membrane flashing, or sealant acceptable to roof manufacturer.

3.02 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Inspect each anchor for conformance to manufacturer requirements, building envelope, looseness, and signs of permanent deflection during load testing.

3.03 ADJUSTING

- A. Adjust fall protection components to function smoothly and safely.

END OF SECTION

**SECTION 133419
METAL BUILDING SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufacturer-engineered, shop-fabricated structural steel building frame.
- B. Insulated Metal wall and roof panels including soffits, gutters and downspouts, and roof mounted equipment curbs.
- C. Exterior doors, windows, skylights, overhead doors, and louvers.

1.02 RELATED REQUIREMENTS

- A. Section 055000 - Metal Fabrications.
- B. Section 079200 - Joint Sealants: Sealing joints between accessory components and wall system.
- C. Section 074113: Metal Roof Panels
- D. Section 074213: Metal Wall Panels
- E. Section 081113 - Hollow Metal Doors and Frames.
- F. Section 083613 - Sectional Doors.
- G. Section 085200 - Wood Windows.

1.03 REFERENCE STANDARDS

- A. AISC 360 - Specification for Structural Steel Buildings; 2016 (Revised 2021).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.
- F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- G. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2019.
- H. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- I. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.
- M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- N. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

- P. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2018.
- Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on profiles, component dimensions, fasteners.
- C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections; wall and roof system dimensions, panel layout, general construction details, anchors and methods of anchorage, and installation; framing anchor bolt settings, sizes, locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.
- D. Samples: Submit two samples of precoated metal panels for each color selected, 12"x12" in size illustrating color and texture of finish.
- E. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.
- F. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- G. Designer's Qualification Statement.
- H. Manufacturer's Qualification Statement: Provide documentation showing metal building manufacturer is certified under AISC.
 - 1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.
 - 2. Include valid AISC Certification
- I. Prime General Contractor must provide proof they are a licensed dealership for the Pre-Engineered Manufacturer and must show minimum (5) years of direct experience with Pre-Engineered Manufacturer and minimum \$5M worth of orders in the past (3) years with the Pre-Engineered Manufacturer.
- J. Erector may be the GC or, if separate, Erector must also provide the same experience with Pre-Engineered Manufacturer .
- K. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- L. Project Record Documents: Record actual locations of concealed components and utilities.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this type of work.
 - 1. Design Engineer Qualifications: Licensed in the State in which the Project is located.
 - 2. Comply with applicable code for submission of design calculations as required for acquiring permits.
 - 3. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide data as requested.
- B. Perform work in accordance with AISC 360.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for Pre-finished panels provide by PEMB.
 - 1. Include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Buildings Systems:
 - 1. VP Buildings: www.vp.com/#sle. (basis of design)
 - 2. Butler Manufacturing Company: www.buttermfg.com/#sle.
 - 3. Nucor Building Systems; _____: www.nucorbuildingsystems.com/#sle.
 - 4. Or Approved Equal
 - 5. Substitutions: See Section 016000 - Product Requirements.

2.02 ASSEMBLIES

- A. Single span rigid frame.
- B. Primary Framing: Rigid frame of rafter beams and columns, canopy beams, and wind bracing.
- C. Secondary Framing: Purlins, and other items detailed.
- D. Wall System: Preformed metal panels with sub-girt framing/anchorage assembly, and accessory components.
- E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, insulation, and liner panels, and accessory components.

2.03 PERFORMANCE REQUIREMENTS

- A. Installed Thermal Resistance of Wall System: See drawings for specific notes regarding insulation values and thermal blocks required by Title 24 envelope for Climate Zone 16.
- B. Installed Thermal Resistance of Roof System: See drawings for specific notes regarding insulation values and thermal blocks required by Title 24 envelope for Climate Zone 16.
- C. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.
- D. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 200 degrees.

2.04 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M.
- B. Structural Tubing: ASTM A500/A500M Grade B cold-formed.
- C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.
- D. Anchor Bolts: ASTM A307, Grade A, with no preference for protective coatings.
- E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.
- F. Welding Materials: Perform in accordance with AWS D1.1/D1.1M.
- G. Primer: SSPC-Paint 20 zinc rich.
- H. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
 - 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).

2.05 MATERIALS - WALLS AND ROOF

- A. Metal Building Type, Factory Applied, Vapor-Barrier Insulation Facings: Water vapor permeance no greater than 0.10 perm (5.7 ng/(Pa s sq m)) when tested in accordance with

ASTM E96/E96M; flame spread index of 25 or less, and smoke developed index of 40 or less when tested in accordance with ASTM E84.

- B. Joint Seal Gaskets: Manufacturer's standard type.
- C. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M, finish to match adjacent surfaces when exterior exposed.
- D. Sealant: ASTM C920, elastomeric sealant with movement capability of at least plus/minus 50 percent; 100 percent silicone; for exposed applications, match adjacent colors as closely as possible.
- E. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Rain Water Diverter, Fascias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.06 COMPONENTS

- A. Doors and Frames: See Section 081113.
- B. Overhead Doors: See Section 083613.
- C. Overhead Door Frame: Formed steel sections braced to building frame; see Section 055000.
- D. Windows: See Section 085200.

2.07 FABRICATION - FRAMING

- A. Fabricate members in accordance with AISC 360 for plate, bar, tube, or rolled structural shapes.
- B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.
- C. Provide wall opening framing for doors, windows, and other accessory components.

2.08 FABRICATION - WALL AND ROOF PANELS

- A. See 074113 for Metal Roof Panel specifications
- B. See 074213 for Metal Wall Panel specifications
- C. Girts/Purlins: Rolled formed structural shape to receive siding, roofing and liner sheet.
- D. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles. Back brace mitered internal corners.
- E. Flashings, Closure Pieces, Fascia: Same material and finish as adjacent material, profile to suit system.
- F. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.

2.09 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate of same material and finish as roofing metal.
- B. Form gutters and downspouts and scuppers of profile and size indicated to collect and remove water. Fabricate with connection pieces.
- C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.
- D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.10 FINISHES

- A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.
- B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, color as selected from manufacturer's standard range.
- C. Interior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, color as selected from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.02 ERECTION - FRAMING

- A. Erect framing in accordance with AISC 360.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION - WALL AND ROOF PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 2 inches (50 mm). Place side laps over bearing.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners.
- G. Install insulation and vapor retarder utilizing Thermal blocks at girts.
- H. Install sealant and gaskets, providing weather tight installation.

3.04 ERECTION - GUTTERS AND DOWNSPOUTS

- A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.
- B. Apply bituminous paint on surfaces in contact with cementitious materials.
- C. Slope gutters minimum 1/8 inch per foot
- D. Install splash pans under each downspout.

3.05 TOLERANCES

- A. Framing Members: 1/4 inch (6 mm) from level; 1/8 inch (3 mm) from plumb.
- B. Siding and Roofing: 1/8 inch (3 mm) from true position.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

A. Design, provide and install:

1. Fire Sprinkler System: Furnish and install all materials and perform all labor necessary for the complete installation of the Fire Protection System, and related items to provide a complete functional system in accordance with the requirements of NFPA Standard #13, NFPA Standard #24, and California State Fire Marshal (CSFM) regulations in all areas of the building including fire sprinkler mains and connection to on-site underground main, appurtenances, and underground piping.
2. System design shall be hydraulically calculated and identified on the Drawings.
 - a. Hydraulically designed sprinkler systems shall be provided with a minimum of a 10 percent safety margin on either the supply or pressure side of the design graph.
 - b. All sprinkler systems shall be designed to provide the appropriate density based upon a hazard occupancy classification specified by NFPA 13
 - c. The water supply requirement for sprinklers only shall be calculated from the density curves in NFPA 13. System piping shall be calculated to satisfy a single-point on the appropriate design curve. It is not necessary to meet all points on the selected curve.
 - d. Approval and acceptance of system is subject to compliance with the listed requirements, plan check approval, approval by field inspection, and necessary tests. Approval of plans and specifications shall not constitute a waiver of approval to violate any code or requirement. Submittals having inaccurate hydraulic calculations, content which is illegible, incomplete, or unclear will be returned without review or approval.

1.2 REQUIREMENTS

A. UNDERGROUND PIPING

1. All underground pipe shall be installed per the latest version of NFPA 24 .
2. Tracer wire shall be taped to nonmetallic piping. Tape shall be applied at a maximum of 20 foot intervals.

3. When the system riser is close to a foundation or footing, underground fittings of proper length shall be used to avoid pipe joints located in or under the wall or footing. When the connection passes through a foundation or footing below grade, a 1- to 2-inch clearance shall be provided around the pipe, and the clear space filled with asphalt mastic or similar flexible waterproofing material

B. MATERIALS

1. General: All materials and equipment shall be new and of latest design of the manufacturer and shall be tested and approved by the Underwriters Laboratories, Inc. Material specification is intended to provide standardization of equipment.
2. Sprinkler Heads: Sprinkler heads shall be UL listed or FM approved, regular, automatic, closed type of ordinary temperature rating (165 degrees F at clg, 200 degrees F at roof) or equal. Heads shall be recessed at all finished ceiling locations. Sprinkler heads in equipment rooms, storage rooms, and in other areas subject to damage shall be standard pendant type provided with wire guards. Higher temperature ratings shall be approved in intermediate and high classification areas.
3. Escutcheons: Escutcheons at all heads shall match finish in which installed, white in white ceilings, brass in wood finishes.
4. Spare Heads: Furnish minimum 6 spare heads. The heads shall be placed in an emergency cabinet. Provide one sprinkler wrench. The cabinet will be of No. 20 gauge pressured steel with red lacquer finish complete with manufacturers standard labeling. The spare heads shall be representative of, and in proportion to, the number of each type and temperature of heads installed.
5. Steel Pipe, Fittings:
 - a. Pipe for installation above ground shall be UL and SFM approved ASTM A-53, A-135.
 - 1) All welded pipe: Schedule 10.
 - 2) All threaded pipe: Schedule 40 black steel.
 - b. Pipe fittings for installation above ground shall conform to the requirements of Federal Specifications WW-P-501, Type I, Class A.
 - 1) Fittings to be UL approved cast iron screwed or grooved with associated couplings. Mechanical tees, saddle fittings, beveled

edge fittings and bushings shall not be used. Grooved pipe and associated fittings shall only be allowed in exposed locations.

- c. Pipe for installation below slab and to 5 feet outside building shall be cast iron pipe conforming to the requirements of Federal Specifications WW-P-421, Types I, II, III, or V, Class 150, U.L. approved for fire lines. Design Builder shall have option to use PVC Pressure Class 150, AWWA C900 piping and fittings UL approved for fire service.
 - 1) Pipe fittings for installation below ground from 5 feet outside building to water main shall be of cast iron conforming to the requirements of American Water Works Association Standard Specification for cast iron Special Castings, Class D, 150 pound, U.L. approved for fire lines. Valve
 - d. OS&Y valve shall be Grinnell, Viking, or equal, gate type, 175 psi working pressure, UL or FM listed for fire protection services.
 - e. Gate valves 2 inches and smaller shall be Crane No. 459, Grinnell, or equal, 2-1/2 inches and larger shall be Crane No. 467, Grinnell, or equal, all to the Underwriters approved rising stem type (OS&Y).
 - f. Check valves shall be Crane No. 375, Grinnell, or equal; drain valves shall be Crane No. 7, Kennedy, or equal.
 - g. Angle valves, globe valves with screw-in bonnet, internal seat and renewable disc.
 - h. Riser check valve: TYCO CV-1FR or equivalent.
 - i. Dry pipe valve: TYCO DPV-1 or equivalent.
- 6. Sprinkler riser assemblies shall be complete with standard trim including Victaulic couplings at top and bottom of riser; pressure gauge; and flow switch with contacts for remote electric alarm and remote monitoring.
 - 7. Flow Switches: Provide CSFM listed paddle type flow switches with automatic recycle retard and double pole, double throw contacts.
 - 8. Tamper Switches: Provide CSFM listed weather-resistant tamper switches on all control valves. PIV switches shall monitor target position. OS&Y switches shall monitor stem movement and shall be complete with J-bolts. Plug and loop type tamper switches shall not be used to supervise control valves.
 - 9. Alarm Switch and Bell
 - a. Potter VSR, or equal, vane type series bell, electric alarm switch for connection to bell. Alarm bells shall be 10-inch diameter, UL or FM approved.

- b. The bell shall be located on the face of the protected building adjacent to the fire department connection (if provided) with a mounting height of eight to ten feet above finished grade.
- 10. Gauges
 - a. Pressure gauges shall UL listed and labeled 3-1/2 inch dial, liquid filled type, 0-300 psi scale, markings not to exceed 5 psi increments.
 - b. Gauges shall be installed on each side of the main check valve and at each test pipe.
 - c. Each pressure gauge shall be fitted with a three-way valve and 1/4 inch test gauge connection.
- 11. Inspector's test connections shall be AGF #3011 Test and Drain, or equal.
- 12. Flashings and Counterflashing's: Submit proposed methods of sealing penetration through exterior of buildings for approval.

1.3 CRITERIA

A. GENERAL

- 1. Installation of the fire protection system shall not be started until complete plans and specifications, including water supply information, have been approved by the Auburn Fire Department. Apply the flow information at the connection of the new underground piping to an existing water main. Maximum velocity through sprinkler lines including cross-mains, bulk mains and risers shall be 30 feet per second. Maximum velocity through the underground shall be 16 feet per second.
- 2. All piping shall be installed as required by NFPA 13 and 24.
- 3. All piping shall be pressure tested and flushed according to the procedures set forth in NFPA 13 and 24.
- 4. Shop drawings shall show locations of earthquake bracing, both lateral and longitudinal. Earthquake bracing shall utilize cast fitting ends to improve

workmanship and projections of plain end pipes protruding from braces. Metal flushclamps shall be used in place of wire style u-bolt brace anchors.

5. All equipment installed shall be properly thrust blocked and earthquake braced. Earthquake bracing and pipe hangers must be drilled through and bolted to structural frame members.
6. Furnish and install all sleeves required for work where it passes through concrete. If sleeves are not installed, all penetrations shall be core drilled. All gaps and seams shall be filled with fire rated caulking material.
7. All valves shall be clearly labeled as to their functions (i.e., MAIN DRAIN, ALARM TEST, etc.).
8. Design Builder shall be responsible for any damage to other work caused by installation or by leaks in the fire protection lines.
9. All work shall be done in a neat and workmanlike manner.

B. QUALITY ASSURANCE

1. Provide all material and perform all work in accordance with all applicable codes, agency standards and manufacturers written instructions.

C. INSTALLATION OF PIPING SYSTEMS

1. Support all piping firmly held in place by approved iron hangers, supports, anchors as required in accordance with NFPA Pamphlet No. 13. Grade as required to drain at low points. Seismic bracing shall be complete pre-engineered system. Hanger rods less than 3/8 inch diameter not permitted.
2. All piping in finished areas must be run concealed above ceilings.
 - a. Overhead sprinkler piping within a "grid" portion of a hydraulically designed system shall not be sized smaller than 1-1/4 inch I.D.
 - b. All piping, including cross-mains, shall be installed as close as practical to the roof structure. Cross-mains shall follow the roofline so as to remain an approximate constant distance from the roof structure.
 - c. Drainage capabilities shall be provided per NFPA 13 to allow for complete drainage of system piping, preferably to the main riser drain or to additional auxiliary drains as needed.
 - d. Connections and fittings shall be threaded, flanged, grooved, or welded. Grooveless clamp or saddle fittings are not acceptable.
 - e. Grooved clamp tees and bolted branch outlets shall not exceed 1-inch branch size and are subject to inspection prior to attachment of branch piping or sprinklers.

- f. Reducing fittings shall be tapered cast metal products. Where grooved couplings are used, there shall be a separate coupling for each connection to the reducing fitting.
- g. Each sprinkler head shall be connected to supply piping via a threaded branch outlet and by a minimum 1-inch to 1/2-inch threaded reducing fitting.

D. SPRINKLER HEAD LOCATION

- 1. Sprinkler heads shall be located at exposed beams and in finished ceilings, (centered in structural bay sections of tiles) soffits, overhangs, etc., and in all enclosed spaces, above ceilings, canopies, overhangs, etc., in accordance with NFPA requirements but conforming to ceiling lighting and building modules which may require additional heads for symmetry.

E. DRAINS

- 1. Inspector's test drain shall be installed with auxiliary drains on all low points of the system. Drain valves shall be in accordance with the requirements of NFPA Pamphlet No. 13 and piped to a safe place of visible discharge either by open-end pipe or sight drain fitting. Do not discharge onto sidewalks or other pedestrian areas. Flushing connections shall be provided at ends of all cross mains.

F. ELECTRICAL REQUIREMENTS

- 1. All wiring, conduit, fuses, thermal overloads, disconnect switches, and connection of all motors, alarms, flow switches is under Electrical Work.

G. COORDINATION

- 1. Design Builder shall be responsible to coordinate the location of sprinkler piping with all existing construction such as suspended ductwork, electrical work and plumbing work, and it shall be the Design Builder who shall off-set and modify the sprinkler system as may be required to coordinate the sprinkler system with all other systems as shown and/or found to be existing.

1.4 EVALUATIONS AND TESTING

A. SUBMITTALS

1. Submit shop Drawings in accordance with Section 013323 Shop Drawings, Product Data and Samples. Prepare and furnish complete detailed plans for the installation of an automatic fire sprinkler system to PG&E and Auburn Fire Department.
2. At a minimum the submittal shall include:
 - a. The address/name of the project, and a site map showing the project location, name and address of the Design Builder. Drawings shall be signed and stamped by the individual assuming design responsibility. Provide a Fire Department signature block for approval.
 - b. Submit hydraulic calculations calculating frictional losses in valves, piping and fittings to demonstrate that the hydraulically most remote area of the fire service water main is adequate to provide the required flow.
 - 1) Indicate water supply information, static and residual pressures.
 - 2) Show on-site backflow prevention devices, hydrants, Fire Department connections, etc., and proposed connection to the on-site main.
 - c. Product data and manufacturer literature to include but not be limited to:
 - 1) Sprinkler heads and accessories, make, type, number, and nominal orifice size.
 - 2) OS&Y, inspector test, drain, check, gate, globe valves, gauges.
 - 3) Pipes and fittings.
 - 4) Hangers and supports.
 - 5) Identification signs.
 - 6) CSFM listing numbers.
 - d. Complete piping plans showing ceiling construction, lights, air distribution outlets, with all areas clearly designated.
 - 1) Show sufficient detail and dimensions to clearly indicate that sprinkler lines will be concealed or arranged neatly in exposed areas and will not conflict with structural,

mechanical or electrical systems. Show feed main hanger locations.

- e. Show location of all control valves and trim, check, drain, test valves and their termination and alarm bell.
 - f. Submit hangers and supports and seismic structural bracing.
 - g. Submit all painting products.
3. A required general note on plans submitted for approval by the University Fire Department and the California State Fire Marshal shall include the following standard wording:
- a. The automatic sprinkler system shall conform to the requirements of the latest edition of NFPA 13.
 - b. Penetrations of rated assemblies shall be fire-stopped. Fire stopping shall be an approved material as described in State Fire Marshal Standard 12-43.1.
 - c. Installation of the sprinkler system shall not be started until completed plans and specifications (including water supply information and capacity of existing sprinkler system, if any) have been approved by the Auburn Fire Department.
 - d. Approved plans and specifications shall be kept on the job site and made available upon request.
 - e. At various stages and upon completion, the system must be tested in the presence of the University Fire Department and/or State Fire Marshal.
4. At completion of work submit all Operation and Maintenance Manuals, all Test, Inspection, and Certification Reports to the University's Representative.
5. Submit as-built record drawings of above and underground work to University's Representative.

B. TESTS AND APPROVALS

1. Tests and Maintenance: All tests described and referenced in these standards shall be performed by the Design Builder in the presence of the Auburn Fire Department representative. A minimum of 72 hour notice is required by the Fire Department prior to need. Tests and inspections shall apply to all water-source fire protection systems, including fire hydrants, sprinklers, standpipes, and all underground piping which supplies these systems and devices.

2. Hydrostatic Test Preparation: The following preparations shall be made for hydrostatic testing.
- a. Underground and other piping directly exposed to the exterior environment and/or piping containing water absorbent material (e.g., asbestos cement) shall be filled with water 24 hours preceding hydrostatic testing.
 - b. Interior piping shall be filled with water two hours preceding hydrostatic testing.
 - c. Piping shall be purged of all air and other gases prior to hydrostatic testing.
 - d. Underground piping shall be center-loaded and all fittings, joints, strapping, and thrust blocking shall be exposed for inspection and hydrostatic testing.
 - e. All above grade and interior piping, fittings, and supports shall be exposed for inspection and hydrostatic testing.
 - f. Fire department connections and piping shall be included in hydrostatic testing and shall be flushed.
 - g. Underground mains and supply connections to sprinkler risers shall be flushed thoroughly before connection to sprinkler systems.
 - h. Test of drainage facilities shall be conducted by opening each drain valve while the system control valves are open to the supply. Systems will be tested in the presence of the Fire Department representative.
 - i. Water remaining in normally dry piping shall be evacuated at completion of testing.
 - j. J. Upon satisfactory completion of all testing and inspections, the contractor shall certify to the University Fire Department by submittal of a completed Form 6, "Contractor's Material & Test Certificate for Aboveground Piping" and/or a Form 7, "Contractor's Material & Test Certificate for Underground Piping" immediately upon completion of said test and inspections. Any variation in procedure must be approved in writing by the Fire Department.
 - k. Hydraulic Nameplate, required sprinkler spares and wrench with box and other control valve signage and miscellaneous required materials shall be provided prior to acceptance of system.
 - l. Design Builder shall be responsible for coordination of all testing. System shall not be acceptable with uncorrected or unresolved deficiencies. Water damage or associated effects as a result of failure of piping or materials are the responsibility of the Design Builder.

END OF SECTION 210000

SECTION 220517
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Pipe sleeves.
- B. Pipe sleeve-seals.
- C. Above-grade flashing panels.

1.02 RELATED REQUIREMENTS

- A. Section 099113 - Exterior Painting: Preparation and painting of exterior piping systems.
- B. Section 099123 - Interior Painting: Preparation and painting of interior piping systems.
- C. Section 220523 - General-Duty Valves for Plumbing Piping.
- D. Section 220553 - Identification for Plumbing Piping and Equipment: Piping identification.
- E. Section 220719 - Plumbing Piping Insulation.

1.03 REFERENCE STANDARDS

- A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2024.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).
- C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified this section.
- C. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

PART 2 PRODUCTS

2.01 PIPE SLEEVES

- A. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- B. Pipe Passing Through Below Grade Exterior Walls:
 - 1. Zinc coated or cast iron pipe.
 - 2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.
- C. Clearances:
 - 1. Provide allowance for insulated piping.

2. Wall, Floor, Partitions, and Beam Flanges: 1 inch (25 mm) greater than external pipe diameter.
3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 078400 to prevent the spread of fire, smoke, and gases.

2.02 PIPE-SLEEVE SEALS

- A. Sealing Compounds:
 1. Provide packing and sealing compound to fill pipe to sleeve thickness.
 2. Combined packing and sealing compounding to match partition fire-resistance hourly rating.
- B. Pipe Sleeve Material:
 1. Bearing Walls: Steel, cast iron, or terra-cotta pipe.
 2. Masonry Structures: Sheet metal or fiber.
- C. Wall Sleeve: PVC material with waterstop collar, and nailer end-caps.

2.03 ABOVE-GRADE FLASHING PANELS

- A. Flashing Panels for Exterior Wall Penetrations: Premanufactured panel with elastomeric collar to seal around piping; select according to piping and facade materials installed.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

3.02 INSTALLATION

- A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- B. Install piping to conserve building space, to not interfere with use of space and other work.
- C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- D. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
 1. Underground Piping: Caulk pipe sleeve watertight with lead and oakum or mechanically expandable chloroprene inserts with bitumen sealed metal components.
 2. Aboveground Piping:
 - a. Pack solid using mineral fiber complying with ASTM C592.
 - b. Fill space with an elastomer caulk to a depth of 0.50 inch (15 mm) where penetrations occur between conditioned and unconditioned spaces.
- E. Manufactured Sleeve-Seal Systems:
 1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
 3. Locate piping in center of sleeve or penetration.
 4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
 5. Tighten bolting for a water-tight seal.
 6. Install in accordance with manufacturer's recommendations.
- F. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.03 CLEANING

- A. Upon completion of work, clean all parts of the installation.

- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.
- C. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

END OF SECTION

**SECTION 220529
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT**

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 055000 - Metal Fabrications.
- B. Section 220548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- C. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping; 2022.
- D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
- E. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures; 1999 (Reapproved 2022).
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
- H. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- I. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- L. FM (AG) - FM Approval Guide; current edition.
- M. MFMA-4 - Metal Framing Standards Publication; 2004.
- N. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- O. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- P. UL (DIR) - Online Certifications Directory; Current Edition.
- Q. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.

1.04 QUALITY ASSURANCE

- A. Comply with applicable building code.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide required hardware to hang or support piping, equipment, or fixtures with related accessories as necessary to complete installation of plumbing work.
- B. Provide hardware products listed, classified, and labeled as suitable for intended purpose.
- C. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 2. Include consideration for vibration, equipment operation, and shock loads where applicable.
- D. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
- E. Materials for Metal Fabricated Supports: Comply with Section 055000.
 - 1. Zinc-Plated Steel: Electroplated in accordance with ASTM B633 unless stated otherwise.
 - 2. Galvanized Steel: Hot-dip galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M unless stated otherwise.
- F. Corrosion Resistance: Use corrosion-resistant metal-based materials fully compatible with exposed piping materials and suitable for the environment where installed.
 - 1. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - 2. Outdoor, Damp, or Wet-Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.

2.02 STRUT SYSTEMS FOR PIPE OR EQUIPMENT SUPPORT

- A. Strut Channels:
 - 1. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.
 - 2. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.
- B. Hanger Rods:
 - 1. Threaded zinc-plated steel unless otherwise indicated.
 - 2. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch (13 mm, DN) diameter.
 - b. Piping up to 1 inch (25 mm, DN): 1/4 inch (6 mm, DN) diameter.
 - c. Piping larger than 1 inch (25 mm, DN): 3/8 inch (10 mm, DN) diameter.
 - d. Trapeze Support for Multiple Pipes: 3/8 inch (10 mm) in length.
- C. Channel Nuts:
 - 1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring as indicated on drawings.

2.03 BEAM CLAMPS

- A. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.

- B. C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
- C. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
- D. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
- E. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
- F. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.

2.04 PIPE HANGERS

- A. Band Hangers, Adjustable:
 - 1. MSS SP-58 type 7 or 9, zinc-plated ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
- B. J-Hangers, Adjustable:
 - 1. MSS SP-58 type 5, zinc-plated ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
 - 2. Felt-Lined: Provide for uninsulated pipe to reduce noise and prevent static issues.
- C. Swivel Ring Hangers, Adjustable:
 - 1. MSS SP-58 type 10, epoxy-painted, zinc-colored.
 - 2. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - 3. FM (AG) and UL (DIR) listed for specific pipe size runs and loads.
- D. Clevis Hangers, Adjustable:
 - 1. Copper Tube: MSS SP-58 type 1, epoxy-plated copper.
 - 2. Felt-Lined: MSS SP-58 type 1, zinc-plated, silicone-free carbon steel.
 - 3. Light-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.
 - 4. Standard-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.

2.05 PIPE CLAMPS

- A. Riser Clamps:
 - 1. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
 - 2. MSS SP-58 type 1 or 8, carbon steel or steel with epoxy plated, plain, stainless steel, or zinc plated finish.
 - 3. Medium Split Horizontal Pipe Clamp: MSS SP-58 type 4, carbon steel or stainless steel with epoxy plated, plain, stainless steel, or zinc plated finish.
 - 4. Copper Tube Pipe Clamp: MSS SP-58 type 8, epoxy plated copper.
 - 5. UL (DIR) listed: Pipe sizes 1/2 to 8 inch (15 to 200 mm, DN).

2.06 PIPE SUPPORTS, GUIDES, SHIELDS, AND SADDLES

- A. Dielectric Barriers: Provide between metallic supports and metallic piping and associated items of dissimilar type; acceptable dielectric barriers include rubber or plastic sheets or coatings attached securely to pipe or item.
- B. Pipe Supports:
 - 1. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - 2. Liquid Temperatures Up to 122 degrees F (50 degrees C):
 - a. Overhead Support: MSS SP-58 types 1, 3 through 12 clamps.
 - b. Support From Below: MSS SP-58 types 35 through 38.
 - 3. Operating Temperatures from 122 to 446 degrees F (50 to 230 degrees C):
 - a. Overhead Support: MSS SP-58 type 1 or 3 through 12 clamps with appropriate saddle of MSS SP-58 type 40 for insulated pipe.

- b. Roller Chair: MSS SP-58 types 41 or 43 through 46 roller chair support with appropriate saddle of MSS SP-58 type 39 for insulated pipe.
 - c. Sliding Support: MSS SP-58 types 35 through 38.
- C. Pipe Supports, Thermal Insulated:
 - 1. General Requirements:
 - a. Insulated pipe supports to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
 - b. Pipe insulation protection shields to be provided at the hanger points and guide locations on pipes requiring insulation as indicated on drawings.
 - c. Surface Burning Characteristics: Flame spread index/smoke developed index of 5/30, maximum, when tested in accordance with ASTM E84 or UL 723.
 - d. Provide pipe supports for 1/2 to 30 inch (15 to 750 mm, DN) iron pipes.
 - e. Insulation inserts to consist of rigid phenolic foam insulation surrounded by 360 degree, PVC jacketing.
 - 2. PVC Jacket:
 - a. Pipe insulation protection shields to be provided with ball bearing hinge and locking seam.
 - b. Moisture Vapor Transmission: 0.0071 perm inch (0.0092 ng/Pa s m), when tested in accordance with ASTM E96/E96M.
 - c. Minimum Thickness: 60 mil, 0.06 inch (1.524 mm).

2.07 SEISMIC BRACING HARDWARE

- A. Cable Suspension Systems:
 - 1. Strut channel or bracket-fitted fitting with locking mechanism for pipe or equipment suspension using cable wires extended to surface-mounted end-fixing fittings.
 - 2. Provide cable wire and end-fixing as required to hold minimum weight of 120 lb (54.4 kg).
- B. Cable Sway Bracing Systems:
 - 1. Cable wire hanger with fix and release spring mechanism enclosed using zinc housing with 302 stainless steel components for pipe or equipment suspension to surface-mounted end-fixing fittings.
 - 2. Provide cable wire and end-fixing as required to hold minimum weight of 25 lb (11.3 kg).

2.08 ANCHORS AND FASTENERS

- A. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
- B. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
- C. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
- D. Steel: Use beam ceiling clamps, beam clamps, machine bolts, or welded threaded studs.
- E. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.
- F. Plastic and lead anchors are not permitted.
- G. Preset Concrete Inserts: Continuous metal strut channel and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - 1. Channel Material: Use galvanized steel.
 - 2. Manufacturer: Same as manufacturer of metal strut channel framing system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Provide thermal insulated pipe supports complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.
- H. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.
- J. Secure fasteners according to manufacturer's recommended torque settings.
- K. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

SECTION 220553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Stencils.
- D. Pipe markers.
- E. Underground warning tape.

1.02 RELATED REQUIREMENTS

- A. Section 099123 - Interior Painting: Identification painting.

1.03 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.
- B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2017.

PART 2 PRODUCTS

2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE

- A. Nameplates:
 - 1. Heat exchangers, water heaters, and other heat transfer products.
 - 2. Control panels, transducers, and other related control equipment products.
- B. Tags:
 - 1. Piping: 3/4 inch (20 mm) diameter and smaller.
- C. Stencil:
 - 1. Piping: 3/4 inch (20 mm) diameter and higher.
- D. Pipe Markers: 3/4 inch (20 mm) diameter and higher.

2.02 NAMEPLATES

- A. Description: Laminated piece with up to three lines of text.
 - 1. Letter Color: White.
 - 2. Letter Height: 1/4 inch (6 mm).
 - 3. Background Color: Black.
 - 4. Nameplate Height: 3/4 inch (19 mm).
 - 5. Nameplate Material:
 - a. Flexible: Vinyl with adhesive backing per ASTM D709.
 - b. Metal: Brass with center-side holes for screw fastening.

2.03 TAGS

- A. Flexible: Vinyl with engraved black letters on light contrasting background color with up to three lines of text. Minimum tag size 1-1/2 inch (40 mm) in diameter.
- B. Piping: 3/4 inch (20 mm) diameter and smaller. Include corrosion resistant chain. Identify service, flow direction, and pressure.

2.04 STENCILS

- A. Pipe: Stencil size required per external insulated or uninsulated pipe diameter.
 - 1. 3/4 to 1-1/4 inch (20 to 30 mm) Range: 1/2 inch (15 mm) text over 8 inch (200 mm) long background.
 - 2. 1-1/2 to 2 inch (40 to 50 mm) Range: 3/4 inch (20 mm) text over 8 inch (200 mm) long background.
- B. Background Paint: Semi-gloss enamel in compliance with Section 099123.

- C. Stencil Paint: As specified in Section 099123, semi-gloss enamel, colors complying with ASME A13.1.

2.05 PIPE MARKERS

- A. Comply with ASME A13.1.
- B. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.
- C. Underground Flexible Marker: Bright-colored continuously printed ribbon tape, minimum 6 inches (150 mm) wide by 4 mil, 0.004 inch (0.10 mm) thick, manufactured for direct burial service.
- D. Identification Scheme, ASME A13.1:
 - 1. Primary: External Pipe Diameter, Uninsulated or Insulated.
 - a. 1-1/2 to 2 inches (38 to 51 mm): Use 8 inch (203 mm) field-length with 3/4 inch (19 mm) text height.
 - b. 2-1/2 to 6 inches (64 to 152 mm): Use 12 inch (305 mm) field-length with 1-1/4 inch (32 mm) text height.
 - 2. Secondary: Color scheme per fluid service.
 - a. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.

2.06 UNDERGROUND WARNING TAPE

- A. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
- B. Non-detectable Type Tape: 6 inches (152 mm) wide, with minimum thickness of 4 mil, 0.004 inch (0.10 mm).
- C. Legend: Type of service, continuously repeated over full length of tape.
- D. Color:

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive identification products.
- B. Prepare surfaces for stencil painting, see Section 099123.

3.02 INSTALLATION

- A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags in clear view and align with axis of piping
- C. Apply stencil painted identification in compliance with Section 099123 requirements. Identify unit with assigned id-number and area being served using pipe marking rules.
- D. Install plastic pipe markers in accordance with manufacturer's instructions.
- E. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
- F. Install underground plastic pipe markers 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried pipe.
- G. Apply ASME A13.1 Pipe Marking Rules:
 - 1. Place pipe marker adjacent to changes in direction.
 - 2. Place pipe marker adjacent each valve port and flange end.
 - 3. Place pipe marker at both sides of floor and wall penetrations.
 - 4. Place pipe marker every 25 to 50 feet (7.6 to 15.2 m) interval of straight run.

END OF SECTION

**SECTION 220719
PLUMBING PIPING INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cellular glass insulation.
- B. Expanded polystyrene insulation.
- C. Flexible elastomeric cellular insulation.
- D. Glass fiber insulation.
- E. Polyisocyanurate cellular plastic insulation.
- F. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 078400 - Firestopping.
- B. Section 099113 - Exterior Painting: Painting insulation jacket.
- C. Section 099123 - Interior Painting: Painting insulation jacket.
- D. Section 221005 - Plumbing Piping: Placement of hangers and hanger inserts.

1.03 REFERENCE STANDARDS

- A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- B. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019.
- D. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007 (Reapproved 2019).
- E. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 2007 (Reapproved 2019).
- F. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- G. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2020a.
- H. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2022a.
- I. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.
- J. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
- K. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2022.
- L. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing; 2022.
- M. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation; 2022.
- N. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2018).
- O. ASTM C1423 - Standard Guide for Selecting Jacketing Materials for Thermal Insulation; 2021.
- P. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2019.

- Q. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- R. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- S. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER INSULATION

- A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K (Ksi) Value: ASTM C177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
 - 2. Maximum Service Temperature: 850 degrees F (454 degrees C).
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- B. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm (0.029 ng/(Pa s m)).
- C. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.03 CELLULAR GLASS INSULATION

- A. Insulation: ASTM C552, Type II, Grade 6.
 - 1. K (Ksi) Value: 0.35 (0.050) at 100 degrees F (38 degrees C).
 - 2. Service Temperature Range: From 250 degrees F (121 degrees C) to 800 degrees F (427 degrees C).
 - 3. Water Vapor Permeability: 0.005 perm inch (0.007 ng/(Pa s m)) maximum per inch.
 - 4. Water Absorption: 0.5 percent by volume, maximum.

2.04 EXPANDED POLYSTYRENE INSULATION

- A. Insulation: ASTM C578; rigid closed cell.
 - 1. K (Ksi) Value: 0.23 at 75 degrees F (0.033 at 24 degrees C).
 - 2. Maximum Service Temperature: 165 degrees F (74 degrees C).
 - 3. Maximum Water Vapor Permeance: 5.0 perm inch (287 ng/(Pa s m)).

2.05 POLYISOCYANURATE CELLULAR PLASTIC INSULATION

- A. Insulation Material: ASTM C591, rigid molded modified polyisocyanurate cellular plastic.
 - 1. Dimension: Comply with requirements of ASTM C585.
 - 2. K (Ksi) Value: 0.18 at 75 degrees F (0.026 at 24 degrees C), when tested in accordance with ASTM C518.
 - 3. Minimum Service Temperature: Minus 70 degrees F (Minus 57 degrees C).
 - 4. Maximum Service Temperature: 300 degrees F (150 degrees C).

5. Water Absorption: 0.5 percent by volume, maximum, when tested in accordance with ASTM D2842.
6. Moisture Vapor Transmission: 4.0 perm inch (5.8 ng/(Pa s m)).
7. Connection: Waterproof vapor barrier adhesive.

2.06 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
 1. Minimum Service Temperature: Minus 40 degrees F (Minus 40 degrees C).
 2. Maximum Service Temperature: 220 degrees F (104 degrees C).
 3. Connection: Waterproof vapor barrier adhesive.
- B. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.
- C. Weather Barrier: Air dried, contact adhesive, compatible with insulation and ASTM E84 compliant.

2.07 JACKETING AND ACCESSORIES

- A. PVC Plastic Jacket:
 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F (Minus 18 degrees C).
 - b. Maximum Service Temperature: 150 degrees F (66 degrees C).
 - c. Moisture Vapor Permeability: 0.002 perm inch (0.0029 ng/(Pa s m)), maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil, 0.010 inch (0.25 mm).
 - e. Connections: Brush on welding adhesive.
 2. Covering Adhesive Mastic: Compatible with insulation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. For hot piping conveying fluids 140 degrees F (60 degrees C) or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- F. For hot piping conveying fluids over 140 degrees F (60 degrees C), insulate flanges and unions at equipment.
- G. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 078400.

- H. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with canvas jacket sized for finish painting.

END OF SECTION

SECTION 221005 PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sanitary waste piping, buried within 5 feet (1500 mm) of building.
- B. Sanitary waste piping, above grade.
- C. Domestic water piping, buried within 5 feet (1500 mm) of building.
- D. Domestic water piping, above grade.
- E. Propane gas piping, buried beyond 5 feet (1500 mm) of building.
- F. Propane gas piping, buried within 5 feet (1500 mm) of building.
- G. Propane gas piping, above grade.
- H. Pipe flanges, unions, and couplings.
- I. Pipe hangers and supports.
- J. Pipe sleeve-seal systems.
- K. Ball valves.
- L. Pressure relief valves.
- M. Control and service valves.

1.02 RELATED REQUIREMENTS

- A. Section 078400 - Firestopping.
- B. Section 083100 - Access Doors and Panels.
- C. Section 099113 - Exterior Painting.
- D. Section 099123 - Interior Painting.
- E. Section 220516 - Expansion Fittings and Loops for Plumbing Piping.
- F. Section 220529 - Hangers and Supports for Plumbing Piping and Equipment.
- G. Section 220553 - Identification for Plumbing Piping and Equipment.
- H. Section 220719 - Plumbing Piping Insulation.
- I. Section 330110.58 - Disinfection of Water Utility Piping Systems.

1.03 REFERENCE STANDARDS

- A. ANSI LC 1/CSA 6.26 - Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing; 2019.
- B. ANSI Z21.22 - American National Standard for Relief Valves for Hot Water Supply Systems; 2015 (Reaffirmed 2020).
- C. ANSI Z223.1 - National Fuel Gas Code; 2024.
- D. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2020.
- E. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- F. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2021.
- G. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- H. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- I. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings: DWV; 2021.
- J. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2018.
- K. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings—DWV; 2017.

- L. ASME B31.1 - Power Piping; 2022.
- M. ASME B31.9 - Building Services Piping; 2020.
- N. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- O. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- P. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2021.
- Q. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- R. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2022.
- S. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984, with Editorial Revision (2019).
- T. ASTM B32 - Standard Specification for Solder Metal; 2020.
- U. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2020.
- V. ASTM B68/B68M - Standard Specification for Seamless Copper Tube, Bright Annealed; 2019.
- W. ASTM B75/B75M - Standard Specification for Seamless Copper Tube; 2020.
- X. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- Y. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- Z. ASTM B302 - Standard Specification for Threadless Copper Pipe, Standard Sizes; 2017.
- AA. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV); 2020.
- BB. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2016.
- CC. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2016.
- DD. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.
- EE. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- FF. ASTM C1540 - Standard Specification for Heavy-Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- GG. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- HH. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.
- II. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2018.
- JJ. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings; 2021.
- KK. AWWA C651 - Disinfecting Water Mains; 2014, with Addendum (2020).
- LL. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2021.
- MM. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2020.
- NN. FM 1680 - Approval Standard for Couplings Used in Hubless Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems Above and Below Ground, Industrial/ Commercial and Residential; 1989.

- OO. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- PP. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- QQ. NFPA 58 - Liquefied Petroleum Gas Code; 2020, with Amendment.
- RR. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- SS. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- TT. UL (DIR) - Online Certifications Directory; Current Edition.
- UU. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.
- D. Project Record Documents: Record actual locations of valves.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

2.02 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Cast Iron Pipe: ASTM A74 extra heavy weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.
- B. Cast Iron Pipe: CISPI 301, hubless.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.
- C. Copper Tube: ASTM B88 (ASTM B88M), Type K (A).
 - 1. Fittings: ASME B16.23, cast copper, or ASME B16.29, wrought copper.

2. Joints: ASTM B32, alloy Sn50 solder.

2.03 SANITARY WASTE PIPING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A74, service weight.
 1. Fittings: Cast iron.
 2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.
- B. Cast Iron Pipe: CISPI 301, hubless, service weight.
 1. Fittings: Cast iron.
 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.04 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Copper Pipe: ASTM B42, hard drawn.
 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
 2. Joints: ASTM B32, alloy Sn95 solder.
 3. Joints: AWS A5.8M/A5.8, BCuP copper and silver braze.
- B. Copper Pipe: ASTM B42, annealed.
 1. Fittings: ASME B16.26, cast bronze.
 2. Joints: Flared.

2.05 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Pipe: ASTM B88 (ASTM B88M), Type K (A), Drawn (H).
 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 2. Fittings: Cast iron, coated.
 3. Joints: ASTM B32, alloy Sn95 solder.
 4. Joints: Grooved mechanical couplings.
 5. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.

2.06 PROPANE GAS PIPING, BURIED BEYOND 5 FEET (1500 MM) OF BUILDING

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 1. Fittings: ASTM A234/A234M, wrought steel welding type, with AWWA C105/A21.5 polyethylene jacket or double layer, half-lapped 10 mil (0.25 mm) polyethylene tape.
 2. Joints: ASME B31.1, welded.

2.07 PROPANE GAS PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 1. Fittings: ASTM A234/A234M, wrought steel welding type, with AWWA C105/A21.5 polyethylene jacket or double layer, half-lapped 10 mil (0.25 mm) polyethylene tape.
 2. Joints: ASME B31.1, welded.

2.08 PROPANE GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
 2. Joints: NFPA 58, threaded or welded to comply with ASME B31.1.
- B. Flexible Gas Piping:
 1. Corrugated Stainless Steel Tubing: Comply with ANSI LC 1/CSA 6.26.
 2. Comply with ASTM E84.
 3. Fittings: Provided by piping system manufacturer.

2.09 PIPE FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 inch (80 mm, DN) and Under:
 1. Ferrous Pipe: Class 150 malleable iron threaded unions.
 2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Sizes Over 1 inch (25 mm, DN):

1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
 2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. No-Hub Couplings:
1. Testing: In accordance with ASTM C1277 and CISPI 310.
 2. Gasket Material: Neoprene complying with ASTM C564.
 3. Band Material: Stainless steel.
 4. Eyelet Material: Stainless steel.
- D. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.10 PIPE HANGERS AND SUPPORTS

- A. See Section 220529 for additional requirements.
- B. Provide hangers and supports that comply with MSS SP-58.
1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 4. Vertical Pipe Support: Steel riser clamp.
 5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
- C. Plumbing Piping - Drain, Waste, and Vent:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch (15 to 40 mm, DN): Malleable iron, adjustable swivel, split ring.
 2. Hangers for Pipe Sizes 2 inch (50 mm, DN) and Over: Carbon steel, adjustable, clevis.
 3. Wall Support for Pipe Sizes to 3 inch (80 mm, DN): Cast iron hook.
 4. Wall Support for Pipe Sizes 4 inch (100 mm, DN) and Over: Welded steel bracket and wrought steel clamp.
 5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- D. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch (15 to 40 mm, DN): Malleable iron, adjustable swivel, split ring.
 2. Hangers for Cold Pipe Sizes 2 inch (50 mm, DN) and Over: Carbon steel, adjustable, clevis.
 3. Hangers for Hot Pipe Sizes 2 to 4 inch (50 to 100 mm, DN): Carbon steel, adjustable, clevis.
 4. Wall Support for Pipe Sizes Up to 3 inch (80 mm, DN): Cast iron hook.
 5. Wall Support for Pipe Sizes 4 inch (100 mm, DN) and Larger: Welded steel bracket and wrought steel clamp.
 6. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 7. Floor Support for Hot Pipe Sizes to 4 inch (100 mm, DN): Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
 8. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- E. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:

2.11 PIPE SLEEVE-SEAL SYSTEMS

- A. Modular Mechanical Seals:
1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.

2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
3. Size and select seal component materials in accordance to service requirements.
4. Service Requirements:
 - a. Corrosion resistant.
 - b. Underground, buried, and wet conditions.
 - c. Fire Resistant: 1 hour, UL (DIR) approved.
5. Glass reinforced plastic pressure end plates.

B. Wall Sleeve: PVC material with water-stop collar, and nailer end-caps.

2.12 BALL VALVES

- A. Construction, 4 inch (100 mm, DN) and Smaller: MSS SP-110, Class 150, 400 psi (2760 kPa) CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded or grooved ends with union.

2.13 PRESSURE RELIEF VALVES

- A. ANSI Z21.22, AGA certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 220516.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed.
- I. Install water piping to ASME B31.9.
- J. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- K. Pipe Sleeve-Seal Systems:
 1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
 3. Locate piping in center of sleeve or penetration.

4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
5. Tighten bolting for a watertight seal.
6. Install in accordance with manufacturer's recommendations.

3.04 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch (10 mm) vertically of location indicated and slope to drain at minimum of 1/4 inch per foot (1:50) slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot (1:400) and arrange to drain at low points.

3.05 FIELD TESTS AND INSPECTIONS

- A. Verify and inspect systems according to requirements by the Authority Having Jurisdiction. In the absence of specific test and inspection procedures proceed as indicated below.
- B. Domestic Water Systems:
 1. Perform hydrostatic testing for leakage prior to system disinfection.
 2. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
 3. General:
 - a. Fill the system with water and raise static head to 10 psi (345 kPa) above service pressure. Minimum static head of 50 to 150 psi (345 to 1,034 kPa). As an exception, certain codes allow a maximum static pressure of 80 psi (551.6 kPa).
- C. Gas Distribution Systems:
 1. Test Preparation: Close each appliance valve or disconnect and cap each connected appliance.
 2. General Systems:
 - a. Inject a minimum of 10 psi (68.9 kPa) of compressed air into the piping system for a duration of 15 minutes and verify with a gauge that no perceptible pressure drop is measured.
 - b. Ensure test pressure gauge has a range of twice the specific pressure rate selected with an accuracy of 1/10 of 1 pound (0.45 kg).
- D. Test Results: Document and certify successful results, otherwise repair, document, and retest.

3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Disinfect water distribution system in accordance with Section 330110.58.
- B. Prior to starting work, verify system is complete, flushed, and clean.
- C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- D. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.07 SERVICE CONNECTIONS

- A. Provide new sanitary sewer services. Before commencing work, check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

- B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves, pressure reducing valve, and sand strainer.
 - 1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Calk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
 - 2. Provide 18 gauge, 0.0478-inch (1.21 mm) galvanized sheet metal sleeve around service main to 6 inch (150 mm) above floor and 6 feet (1800 mm) minimum below grade. Size for minimum of 2 inches (50 mm) of loose batt insulation stuffing.

3.08 SCHEDULES

- A. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Pipe Size: 1/2 inch (15 mm, DN) to 1-1/4 inch (32 mm, DN):
 - 1) Maximum Hanger Spacing: 6.5 ft (2 m).
 - 2) Hanger Rod Diameter: 3/8 inches (9 mm).
 - b. Pipe Size: 1-1/2 inch (40 mm, DN) to 2 inch (50 mm, DN):
 - 1) Maximum Hanger Spacing: 10 ft (3 m).
 - 2) Hanger Rod Diameter: 3/8 inch (9 mm).
 - c. Pipe Size: 2-1/2 inch (65 mm, DN) to 3 inch (80 mm, DN):
 - 1) Maximum Hanger Spacing: 10 ft (3 m).
 - 2) Hanger Rod Diameter: 1/2 inch (13 mm).
 - d. Pipe Size: 4 inch (100 mm, DN) to 6 inch (150 mm, DN):
 - 1) Maximum Hanger Spacing: 10 ft (3 m).
 - 2) Hanger Rod Diameter: 5/8 inch (15 mm).

END OF SECTION

**SECTION 221006
PLUMBING PIPING SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Drains.
- B. Cleanouts.
- C. Hose bibbs.
- D. Hydrants.
- E. Washing machine outlet boxes.
- F. Ice maker outlet boxes.
- G. Mixing valves.
- H. Relief valves.
- I. Floor drain trap seals.

1.02 RELATED REQUIREMENTS

- A. Section 016000 - Product Requirements: Procedures for Owner-supplied products.
- B. Section 221005 - Plumbing Piping.
- C. Section 223000 - Plumbing Equipment.
- D. Section 224000 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASME A112.6.3 - Floor Drains; 2022.
- C. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers; 2023.
- D. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies; 2021.
- E. ASSE 1017 - Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems; 2023.
- F. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
- G. ASTM B75/B75M - Standard Specification for Seamless Copper Tube; 2020.
- H. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- I. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- J. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- K. PDI-WH 201 - Water Hammer Arresters; 2017.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS

2.03 WASHING MACHINE OUTLET BOXES

- A. Description: Plastic preformed rough-in box with brass quarter-turn ball valves or single lever-handle valves, socket for 2 inch (50 mm) waste, and slip-in finishing cover.
- B. Accessories:
 - 1. Water-hammer arrestors.
 - 2. Support brackets for installation between framing studs.

2.04 MIXING VALVES

- A. Thermostatic Master Mixing Valves:
 - 1. Valve: ASSE 1017, bronze or brass body; thermostatic element; corrosion- and lime-resistant internal components; integral locking temperature adjustment.
- B. Water Temperature Limiting Valves:
 - 1. Valve: ASSE 1070, bronze or brass body; thermostatic element; corrosion- and lime-resistant internal components; integral locking temperature adjustment with high-temperature limit stop; integral check valves with strainer screens on inlets.

2.05 RELIEF VALVES

- A. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.

END OF SECTION

SECTION 223000 PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. UL 1453 - Standard for Electric Booster and Commercial Storage Tank Water Heaters; Current Edition, Including All Revisions.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data:
 - 1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
 - 2. Indicate pump type, capacity, power requirements.
 - 3. Provide electrical characteristics and connection requirements.
- C. Shop Drawings:
 - 1. Indicate heat exchanger dimensions, size of tapings, and performance data.
 - 2. Indicate dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tapings, and drains.
- D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty for domestic water heaters.

PART 2 PRODUCTS

2.01 WATER HEATERS

- A. Commercial Electric Water Heaters:
 - 1. Type: Factory-assembled and wired, electric, vertical storage.
 - 2. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
 - 3. Performance:
 - 4. Electrical Characteristics:
 - 5. Tank: Glass lined welded steel; 4 inch (100 mm) diameter inspection port, thermally insulated with minimum 2 inches (50 mm) glass fiber encased in corrosion-resistant steel jacket; baked-on enamel finish.
 - 6. Controls: Automatic immersion water thermostat; externally adjustable temperature range from 60 to 180 degrees F (16 to 82 degrees C), flanged or screw-in nichrome elements, high temperature limit thermostat.
 - 7. Accessories:
 - 8. Heating Elements: Flange-mounted immersion elements; individual elements sheathed with Incoloy corrosion-resistant metal alloy, rated less than 75 W/sq in (11.6 W/sq m).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions of certification, if any.
- B. Coordinate with plumbing piping and related fuel piping work to achieve operating system.

END OF SECTION

SECTION 224000 PLUMBING FIXTURES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).
- C. ASME A112.18.1 - Plumbing Supply Fittings; 2018, with Errata.
- D. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
- E. ASME A112.19.1 - Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures; 2018.
- F. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2018, with Errata.
- G. ASME A112.19.1 - Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures; 2018.
- H. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2022.
- I. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- K. NSF 61 - Drinking Water System Components - Health Effects; 2022, with Errata.
- L. NSF 372 - Drinking Water System Components - Lead Content; 2024.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty for electric water cooler.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Maximum Fixture or Faucet Supply Pressure: 60 psi (4.1 bar) unless stated otherwise.

2.02 LAVATORIES

- A. Thermostatic Mixing Valve:
 - 1. ASSE 1070 listed with combination stop, strainer, and check valves, and flexible stainless steel connectors.

2.03 UNDER-LAVATORY PIPE SUPPLY COVERS

- A. General:
 - 1. Insulate exposed drainage piping including hot, cold and tempered water supplies under lavatories or sinks per ADA Standards.
 - 2. Construction: 1/8 inch (3.2 mm) PVC with antimicrobial, antifungal and UV resistant properties.
 - a. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
 - b. Comply with ICC A117.1.
 - 3. Color: High gloss white.
 - 4. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces. No cable ties allowed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.02 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome-plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.
- E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.

3.04 INTERFACE WITH WORK OF OTHER SECTIONS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.06 CLEANING

- A. Clean plumbing fixtures and equipment.
- B. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

3.07 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 230593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2008, with Errata (2019).
- C. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2002.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Installer Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.
- C. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
 - 1. Include certification that the plan developer has reviewed Contract Documents, the equipment and systems, and the control system with the Architect and other installers to sufficiently understand the design intent for each system.
 - 2. Include at least the following in the plan:
 - a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - d. Final test report forms to be used.
 - e. Procedures for formal deficiency reports, including scope, frequency and distribution.
- D. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 - 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
 - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
 - 3. SMACNA (TAB).
 - 4. Maintain at least one copy of the standard to be used at project site at all times.
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
 - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 - 2. Having minimum of three years documented experience.
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.
 - 10. Air outlets are installed and connected.
 - 11. Duct system leakage is minimized.
- B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
- C. Beginning of work means acceptance of existing conditions.

3.03 PREPARATION

- A. Hold a pre-balancing meeting at least one week prior to starting TAB work.
 - 1. Require attendance by all installers whose work will be tested, adjusted, or balanced.

3.04 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.05 RECORDING AND ADJUSTING

- A. Field Logs: Maintain written logs including:
 - 1. Running log of events and issues.
 - 2. Discrepancies, deficient or uncompleted work by others.
 - 3. Contract interpretation requests.
 - 4. Lists of completed tests.
- B. Ensure recorded data represents actual measured or observed conditions.
- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
- E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

- F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- G. Check and adjust systems approximately six months after final acceptance and submit report.

3.06 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches (12.5 Pa) positive static pressure in rooms indicated as positive pressure requirements on plans.
- L. For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

3.07 SCOPE

- A. Test, adjust, and balance the following:
 - 1. Air Handling Units.
 - 2. Fans.
 - 3. Air Inlets and Outlets.

3.08 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
 - 1. HP/BHP.
 - 2. Phase, voltage, amperage; nameplate, actual, no load.
 - 3. RPM.
- B. Air Moving Equipment:
 - 1. Location.
 - 2. Manufacturer.
 - 3. Model number.
 - 4. Serial number.
 - 5. Arrangement/Class/Discharge.
 - 6. Air flow, specified and actual.
 - 7. Return air flow, specified and actual.

8. Outside air flow, specified and actual.
 9. Total static pressure (total external), specified and actual.
 10. Discharge pressure.
 11. Fan RPM.
- C. Return Air/Outside Air:
1. Design return air flow.
 2. Actual return air flow.
 3. Design outside air flow.
 4. Actual outside air flow.
 5. Return air temperature.
 6. Outside air temperature.
- D. Exhaust Fans:
1. Location.
 2. Manufacturer.
 3. Model number.
 4. Serial number.
 5. Air flow, specified and actual.
 6. Total static pressure (total external), specified and actual.
 7. Inlet pressure.
 8. Discharge pressure.
 9. Fan RPM.
- E. Duct Leak Tests:
1. Description of ductwork under test.
 2. Duct capacity, air flow.
 3. Maximum allowable leakage duct capacity times leak factor.
 4. Test apparatus:
 - a. Blower.
 5. Test static pressure.
 6. Test orifice differential pressure.
 7. Leakage.

END OF SECTION

SECTION 230713 DUCT INSULATION

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- E. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2020.
- F. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2019.
- G. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings; 2019 (Reapproved 2022).
- H. ASTM C1423 - Standard Guide for Selecting Jacketing Materials for Thermal Insulation; 2021.
- I. ASTM C1775 - Standard Specification for Laminate Protective Jacket and Tape for Use Over Thermal Insulation for Outdoor Applications; 2022.
- J. ASTM D5590 - Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay; 2017 (Reapproved 2021).
- K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- M. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- N. SAE AMS3779 - Tape, Adhesive, Pressure-Sensitive Thermal Radiation Resistant, Aluminum Coated Glass Cloth; 2016b.
- O. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, FLEXIBLE

- A. Manufacturer:
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
 - 1. K (Ksi) value: 0.36 at 75 degrees F (0.052 at 24 degrees C), when tested in accordance with ASTM C518.

2. Maximum Water Vapor Absorption: 5.0 percent by weight.
- C. Vapor Barrier Jacket:
 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 2. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/(Pa s m)), when tested in accordance with ASTM E96/E96M.
- D. Vapor Barrier Tape:
 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.

2.03 GLASS FIBER, RIGID

- A. Insulation: ASTM C612; rigid, noncombustible blanket.
- B. Vapor Barrier Jacket:
 1. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/(Pa s m)), when tested in accordance with ASTM E96/E96M.
- C. Protective Coating:

2.04 WEATHER BARRIER COATINGS

- A. Weather-Resistive Barrier Coating: Fire-resistive, UV resistant, water-based mastic for use over closed cell polyethylene and polyurethane foam insulation; applied with glass fiber or synthetic reinforcing mesh.
 1. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A, when tested in accordance with ASTM E84.
 2. Water Vapor Permeance: Greater than 1.0 perm (57 ng/(Pa s m)) in accordance with ASTM E96/E96M.
 3. Resistance to Fungal Growth: No growth when tested in accordance with ASTM D5590.

2.05 JACKETING AND ACCESSORIES

- A. Aluminum Jacket:
 1. Comply with ASTM B209/B209M, Temper H14, minimum thickness of 0.016 inch (0.41 mm) with factory-applied polyethylene and kraft paper moisture barrier on the inside surface.
 2. Thickness: 0.016 inch (0.40 mm) sheet.
 3. Finish: Smooth.
 4. Fittings: 0.016 inch (0.40 mm) thick die-shaped fitting covers with factory-attached protective liner.
 5. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.015 inch (0.38 mm) thick aluminum.
- B. Aluminum-Foil Laminate Jacket:
 1. Factory-applied, pressure sensitive adhesive jacketing on paper release liner.
 2. Finish: Aluminum smooth.
 3. Comply with ASTM C1775.
- C. Aluminum-Foil Laminate Jacket:
 1. Factory-applied, pressure sensitive adhesive jacketing to comply with ASTM C1775.
- D. Flexible Weather-Proofing Outdoor Jacket: Self-healing, field-applied outdoor cladding.
 1. Material: Aluminum foil/polymer laminate with rubberized asphalt layer and acrylic adhesive.
 2. Thickness: 34 mil, 0.034 inch (0.86 mm).
 3. Finish: Embossed.
 4. Color: Silver.
 5. Water Vapor Transmission: 0.002 perm inch (0.0029 ng/(Pa s m)), maximum, when tested in accordance with ASTM E96/E96M.
 6. Mold Resistance: Pass when tested in accordance with ASTM C1338.
- E. Reinforced Tape:

1. FSK tape suitable for sealing seams between insulation, insulated elbows, and fittings resulting in a tight, smooth surface without wrinkles.
2. Comply with UL 723 or ASTM E84.
3. Moisture Vapor Permeability: 0.00 perm inch (0.00 ng/(Pa s m)), when tested in accordance with ASTM E96/E96M.
4. Finish: Match insulation.

2.06 DUCT LINER

- A. Note: Choose the liner type - Elastomeric Foam or Glass Fiber.
- B. Glass Fiber Insulation: Non-corrosive, incombustible glass fiber complying with ASTM C1071; flexible blanket, rigid board, and preformed round liner board; impregnated surface and edges coated with poly vinyl acetate polymer, acrylic polymer, or black composite.
 1. Fungal Resistance: No growth when tested according to ASTM G21.
 2. Apparent Thermal Conductivity: Maximum of 0.31 at 75 degrees F (0.045 at 24 degrees C).
 3. Service Temperature: Up to 250 degrees F (121 degrees C).
 4. Rated Velocity on Coated Air Side for Air Erosion: 5,000 fpm (25.4 m/s), minimum.
 5. Minimum Noise Reduction Coefficients:
 - a. 1/2 inch (13 mm) Thickness: 0.30.
 - b. 1 inch (25 mm) Thickness: 0.45.
 - c. 1-1/2 inches (40 mm) Thickness: 0.60.
- C. Adhesive: Waterproof, fire-retardant type, ASTM C916.
- D. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Test ductwork for design pressure prior to applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Insulated Ducts Conveying Air Below Ambient Temperature:
 1. Provide insulation with vapor barrier jackets.
 2. Finish with tape and vapor barrier jacket.
 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with outdoor jacket finished; see Section 2.05.D..
- D. Slope exterior ductwork to shed water.
- E. External Duct Insulation Application:
 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 2. Secure insulation without vapor barrier with staples, tape, or wires.

END OF SECTION

**SECTION 230913
INSTRUMENTATION AND CONTROL DEVICES FOR HVAC**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Thermostats:
 - 1. Electric thermostats.
- B. Time switches.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- B. NEMA BS 31032 - Residential Controls--Electrical Wall-Mounted Room Thermostats; 2025.
- C. UL 916 - Energy Management Equipment; Current Edition, Including All Revisions.
- D. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide description and engineering data for each control system component. Include sizing as requested. Provide data for each system component and software module.

PART 2 PRODUCTS

2.01 EQUIPMENT - GENERAL

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

2.02 THERMOSTATS

- A. Electric Thermostats:
 - 1. Type: NEMA BS 31032, 24 volts, 7-day programmable Title-24 compliant thermostat with input for demand response signal..
 - 2. Service: Cooling and heating.
 - 3. Covers: Locking with set point adjustment, with thermometer.

2.03 TIME SWITCHES

- A. Digital Electronic Time Switches:
 - 1. Description: Factory-assembled, solid-state programmable controller with LCD display, listed and labeled as complying with UL 916 or UL 917.
 - 2. Program Capability:
 - a. 7-Day Time Switches: Single channel, capable of different schedule for each day of the week with additional holiday schedule available to override normal schedule for selected days.
 - 3. Schedule Capacity: Not less than 16 programmable on/off operations.
 - 4. Provide automatic daylight savings time and leap year compensation.
 - 5. Provide power outage backup to retain programming and maintain clock.
 - 6. Manual Override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
 - 7. Input Supply Voltage: As indicated on the drawings.
 - 8. Provide lockable enclosure; environmental type complying with NEMA EN 10250 as specified for the following installation locations:

END OF SECTION

SECTION 231126
FACILITY LIQUEFIED-PETROLEUM GAS PIPING

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 230516 - Expansion Fittings and Loops for HVAC Piping.
- B. Section 312316 - Excavation.

1.02 REFERENCE STANDARDS

- A. ANSI Z21.18/CSA 6.3 - Gas Appliance Pressure Regulators; 2019.
- B. ANSI Z21.80/CSA 6.22 - Line Pressure Regulators; 2019.
- C. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- D. ASME B31.1 - Power Piping; 2022.
- E. ASME B31.9 - Building Services Piping; 2020.
- F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- G. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2022.
- H. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2018.
- I. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2015.
- J. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- K. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- L. NFPA 58 - Liquefied Petroleum Gas Code; 2020, with Amendment.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.

PART 2 PRODUCTS

2.01 PROPANE GAS PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 - 1. Fittings: ASTM A234/A234M, wrought steel welding type, with AWWA C105/A21.5 polyethylene jacket or double layer, half-lapped 10 mil (0.25 mm) polyethylene tape.
 - 2. Joints: ASME B31.1, welded.

2.02 PROPANE GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 - 1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
 - 2. Joints: NFPA 58, threaded or welded to ASME B31.1.

2.03 FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 Inches (80 mm) and Under:
 - 1. Ferrous Pipe: Class 150 malleable iron threaded unions.

2.04 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 - 4. Vertical Pipe Support: Steel riser clamp.
 - 5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
- B. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
 - 1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 - 2. Other Types: As required.

2.05 BALL VALVES

- A. Construction, 4 Inches (100 mm) and Smaller: MSS SP-110, Class 150, 400 psi (2760 kPa) CWP, bronze, ductile iron, or _____ body, 304 stainless steel or chrome plated brass ball, regular port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder, threaded, grooved, or _____ ends with union.

2.06 STRAINERS

- A. Size 2 inch (50 mm) and Under:
 - 1. Threaded brass body for 175 psi (1200 kPa) CWP, Y pattern with 1/32 inch (0.8 mm) stainless steel perforated screen.
 - 2. Class 150, threaded bronze body 300 psi (2070 kPa) CWP, Y pattern with 1/32 inch (0.8 mm) stainless steel perforated screen.

2.07 LINE PRESSURE REGULATORS AND APPLIANCE REGULATORS INDICATORS

- A. Compliance Requirements:
 - 1. Appliance Regulator: ANSI Z21.18/CSA 6.3.
 - 2. Line Pressure Regulator: ANSI Z21.80/CSA 6.22.
- B. Materials in Contact With Gas:
 - 1. Housing: Aluminum, steel (free of non-ferrous metals).
 - 2. Seals and Diaphragms: NBR-based rubber.
- C. Maximum Inlet Operating Pressure: 10 psi (68.9 kPa).
 - 1. Appliance Regulator: 10 psi (68.9 kPa).
 - 2. Line Pressure Regulator: 10 psi (68.9 kPa).
- D. Maximum Body Pressure: 10 psi (1000 mbar).
- E. Output Pressure Range: 1 inch wc (2.5 mbar) to 80 inch wc (200 mbar).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 230516.
- D. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- E. Excavate in accordance with Section 312316.
- F. Sleeve pipes passing through partitions, walls and floors.
- G. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.

2. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

END OF SECTION

SECTION 233100 HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 233319 - Duct Silencers.
- B. Section 233700 - Air Outlets and Inlets: Fabric air distribution devices.

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- C. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2015.
- D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- E. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2021.
- F. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for duct materials.
- C. Shop Drawings: Indicate duct fitting types, gauges, sizes, welds, and configuration.

1.04 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Provide metal duct unless otherwise indicated. Fibrous glass duct can be substituted at the Contractor's option.
- C. Acoustical Treatment: Provide sound-absorbing liners and sectional silencers for metal-based ducts in compliance with Section 233319.
- D. Duct Shape and Material in accordance with Allowed Static Pressure Range:
 - 1. Round: Plus or minus 2 in-wc (500 Pa) of galvanized steel.
 - 2. Rectangular: Plus or minus 1/2 in-wc (125 Pa) of galvanized steel.
 - 3. Flexible Duct (Fabric and wire): Plus or minus 1/2 in-wc (125 Pa); see Section 233700.
- E. Duct Sealing and Leakage in accordance with Static Pressure Class:
 - 1. Duct Pressure Class and Material for Common Mechanical Ventilation Applications:
 - a. Supply Air: 1/2 in-wc (125 Pa) pressure class, galvanized steel.
 - b. Outside Air Intake: 1/2 in-wc (125 Pa) pressure class, galvanized steel.
 - c. Return and Relief Air: 1/2 in-wc (125 Pa) pressure class, galvanized steel.
 - d. General Exhaust Air: 1/2 in-wc (125 Pa) pressure class, galvanized steel.
- F. Duct Fabrication Requirements:
 - 1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
 - 2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.

3. Construct tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide airfoil turning vanes of perforated metal with glass fiber insulation.
4. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
5. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
6. Provide turning vanes of perforated metal with glass fiber insulation when an acoustical lining is required.
7. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.02 METAL DUCTS

- A. Material Requirements:
 1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Round Metal Ducts:
 1. Round Single Wall Duct: Round lock seam duct with galvanized steel outer wall.
 2. Round Connection System: Interlocking duct connection system per SMACNA (DCS).
- C. Round Spiral Duct:
 1. Round spiral lock seam duct with galvanized steel outer wall.
- D. Connectors, Fittings, Sealants, and Miscellaneous:
 1. Fittings: Manufacture with solid inner wall of perforated galvanized steel.
 2. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
 3. Hanger Fasteners: Attach hangers to structure using appropriate fasteners as follows:
 - a. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 - b. Concrete Screw Type Anchors: Complying with ICC-ES AC193.

2.03 FLEXIBLE DUCTS

- A. Flexible Air Ducts:
 1. UL 181, Class 1, polyethylene film supported by helically wound spring steel wire.
 2. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
 3. Pressure Rating: From 10 in-wc (2.50 kPa) to 5 in-wc (1.25 kPa) negative.
 4. Maximum Velocity: 5,500 fpm (27.9 m/s).
 5. Temperature Range: Minus 20 to 250 degrees F (Minus 28 to 121 degrees C).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- C. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.
- D. Provide openings in ductwork as indicated to accommodate thermometers and controllers. Provide pilot tube openings as indicated for testing of systems, complete with metal can with spring device or screw to insure against air leakage. For openings, insulate ductwork and install insulation material inside a metal ring.
- E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

F. At exterior wall louvers, seal duct to louver frame and install blank-out panels.

END OF SECTION

SECTION 233416 CENTRIFUGAL HVAC FANS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bearings and drives.

1.02 RELATED REQUIREMENTS

- A. Section 230548 - Vibration and Seismic Controls for HVAC.
- B. Section 230713 - Duct Insulation.
- C. Section 233300 - Air Duct Accessories: Backdraft dampers.
- D. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
- B. AMCA 99 - Standards Handbook; 2016.
- C. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2016.
- D. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; 2014.
- E. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2014.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on centrifugal fans and accessories including fan curves with specified operating point plotted, power, rpm, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate assembly of centrifugal fans and accessories including fan curves with specified operating point plotted, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
- C. Fabrication: Comply with AMCA 99.

2.02 WHEEL AND INLET

2.03 BEARINGS AND DRIVES

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install fans with resilient mountings and flexible electrical leads, see Sections 230548 and 260583.
- C. Install flexible connections between fan inlet and discharge ductwork; see Section 233300. Ensure metal bands of connectors are parallel with minimum one inch (25 mm) flex between ductwork and fan while running.

- D. Install fan restraining snubbers; see Section 230548. Adjust snubbers to prevent tension in flexible connectors when fan is operating.
- E. Provide safety screen where inlet or outlet is exposed.
- F. Provide backdraft dampers on exhaust fans located at discharge side; see Section 233300.

END OF SECTION

**SECTION 233423
HVAC POWER VENTILATORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Inline centrifugal fans and blowers.

1.02 RELATED REQUIREMENTS

- A. Section 230513 - Common Motor Requirements for HVAC Equipment.
- B. Section 233100 - HVAC Ducts and Casings.
- C. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
- B. AMCA 99 - Standards Handbook; 2016.
- C. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2020.
- D. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2016.
- E. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; 2014.
- F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2014.
- G. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- H. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- I. UL 705 - Power Ventilators; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Fan Belts: One set for each individual fan.

PART 2 PRODUCTS

2.01 POWER VENTILATORS - GENERAL

- A. Static and Dynamically Balanced: Comply with AMCA 204.
- B. Performance Ratings: Comply with AMCA 210, bearing certified rating seal.
- C. Sound Ratings: Comply with AMCA 301, tested to AMCA 300, bearing certified sound ratings seal.
- D. Fabrication: Comply with AMCA 99.
- E. UL Compliance: UL 705, listed, labeled, designed, manufactured, and tested.
- F. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- G. Enclosed Safety Switches: Comply with NEMA EN 10250.

2.02 INLINE CENTRIFUGAL FANS AND BLOWERS

- A. Centrifugal Fan Unit: V-belt or direct driven, with galvanized steel housing lined with acoustic insulation, resiliently-mounted motor, gravity backdraft damper in discharge.

- B. Forward Curved Blower:
 - 1. Direct-driven, resiliently mounted motor, heavy-duty ball bearings, galvanized steel housing for indoor or outdoor service, and removable service panels.
 - 2. Operation: As indicated on drawings.
 - 3. Accessories: Provide filter section, intake hood with bird screen, and MERV- __ filters.
- C. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm gets reached with sheaves set at mid-position; fan shaft with self-aligning prelubricated ball bearings.
- D. Performance Ratings: As indicated on drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install backdraft dampers on inlet to roof and wall exhausters.
- C. Provide backdraft dampers on outlet from cabinet and ceiling exhausters fans and as indicated.

END OF SECTION

SECTION 233516 ENGINE EXHAUST SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ductwork and duct accessories.
- B. Exhaust system accessories.

1.02 RELATED REQUIREMENTS

- A. Section 230513 - Common Motor Requirements for HVAC Equipment: Fan motors.
- B. Section 230548 - Vibration and Seismic Controls for HVAC: Vibration isolators.
- C. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. ACGIH (IV) - Industrial Ventilation: A Manual of Recommended Practice for Design, 31st Edition; 2023, with Errata (2025).
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2021.
- D. SMACNA (RIDC) - Rectangular Industrial Duct Construction Standards; 2007.
- E. SMACNA (ROUND) - Round Industrial Duct Construction Standards; 2013.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers literature and data sheets indicating rated capacities, dimensions, weights and point loadings, accessories, electrical characteristics and connection requirements, wiring diagrams, and location and sizes of field connections.

1.05 FIELD CONDITIONS

- A. Permanent exhaust system may not be used for ventilation during construction.
- B. Permanent exhaust system may be used for ventilation during construction only after ductwork is clean, filters are in place, bearings have been lubricated, and fan has been test run under observation.

PART 2 PRODUCTS

2.01 DUCTWORK AND DUCT ACCESSORIES

- A. Materials:
 - 1. Galvanized Steel Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G90/Z275 coating.
 - 2. Coated Galvanized Steel Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 zinc coating and 4 mil (0.1 mm) polyvinyl chloride coating inside and out.

2.02 EXHAUST SYSTEM ACCESSORIES

- A. Tail Pipe Adapters: Rubber formed to tapered cone with spring clip attachment, adapter size 6 inch (150 mm), for connection to 2-1/2 inch (65 mm) diameter hose.
- B. Flexible Exhaust Hose: Galvanized steel, 28 gauge, 0.0149 inch (0.38 mm).
- C. Overhead Suspension System: System to support overhead hose consisting of 1/8 inch (3 mm) diameter braided steel cable, 2 inch (50 mm) diameter cadmium plated cast steel swivel pulleys, 6 inch (150 mm) cadmium plated cast steel cleats.

- D. Exhaust Hose Reel: Spring operated, manually controlled reel consisting of metal cylinder with internal aluminum flexible pipe, zinc plated steel stand, two steel springs, brake mechanism, hose stop, hose guide and 16 feet (5 meters) of 2-1/2 inch (65 mm) diameter hose.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Install fans with resilient mounting and flexible electrical leads. See Section 230548 and Section 260583.
- C. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- D. Tape joints of PVC coated metal ductwork with PVC tape. Backfill with sand.

END OF SECTION

**SECTION 233700
AIR OUTLETS AND INLETS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Diffusers:
- B. Rectangular ceiling diffusers.
- C. Registers/grilles:
 - 1. Ceiling-mounted, exhaust and return register/grilles.
 - 2. Ceiling-mounted, supply register/grilles.
- D. Duct-mounted supply and return registers/louvers.
- E. Fabric air distribution devices.
- F. Louvers:
 - 1. Combination louvers.

1.02 REFERENCE STANDARDS

- A. ACGIH (IV) - Industrial Ventilation: A Manual of Recommended Practice for Design, 31st Edition; 2023, with Errata (2025).
- B. AHRI 880 (I-P) - Performance Rating of Air Terminals; 2017 (Reaffirmed 2023).
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- E. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2021.
- F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
- G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2021.
- H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.
- I. UL 2518 - Standard for Safety Air Dispersion Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.01 RECTANGULAR CEILING DIFFUSERS

- A. Type: Provide rectangular and square formed adjustable, backpan stamped, core removable, and multi-louvered ceiling diffusers constructed to maintain 360 degree discharge air pattern with sectorizing baffles where indicated.
- B. Connections: Round.
- C. Frame: Provide surface mount, snap-in, inverted T-bar, and spline type. In plaster ceilings, provide plaster frame and ceiling frame.
- D. Fabrication: Steel with baked enamel finish.
- E. Color: As selected by Architect from manufacturer's standard range.

2.02 DUCT-MOUNTED SUPPLY AND RETURN REGISTERS/LOUVERS

- A. Type: Duct-mounted, rectangular register for round-spiral duct with adjustable pivot-ended blades, end caps, built-in volume damper, and dual cover flanges to lay flush on duct surface regardless of diameter. Performance to match manufacturer's catalog data.
- B. Material: 22 gauge, 0.0299 inch (0.76 mm).

2.03 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with blades set at 45 degrees, vertical face.
- B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting.

2.04 FABRIC AIR DISTRIBUTION DEVICES

- A. General Requirements:
 - 1. Diffuser material to comply with ASTM E84, UL 723, UL 2518, NFPA 90A, and NFPA 90B.
 - 2. Air Dispersion Method:
 - 3. Hanger Supports:

2.05 COMBINATION LOUVERS

- A. Size: As indicated on the drawings.
- B. Material: Extruded galvanized steel.
- C. Paint Finish and Color: As indicated on the drawings.
- D. Sleeve or Flange: Factory-mounted standard.
- E. Mounting: Furnish with interior flat flange for installation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers and grilles and registers, despite whether dampers are specified as part of diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black, see Section 099123.

3.02 CLOSEOUT ACTIVITIES

- A. Demonstrate operational system to Owner's representative.
- B. Instruct Owner's representative to maintain system and use occupant controls or interfaces, as required.

3.03 PROTECTION

- A. Protect installed products until completion of project.
- B. Replace, repair, or touch-up damaged products before Substantial Completion.

END OF SECTION

**SECTION 235100
BREECHINGS, CHIMNEYS, AND STACKS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured breechings.

1.02 RELATED REQUIREMENTS

- A. Section 230513 - Common Motor Requirements for HVAC Equipment: Induced draft fan motor.
- B. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. ANSI Z223.1 - National Fuel Gas Code; 2024.
- B. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
- C. ASME B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges; 2021.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- E. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping; 2022.
- F. ASTM A194/A194M - Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both; 2024.
- G. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2022.
- H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
- I. NFPA 54 - National Fuel Gas Code; 2021.
- J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; 2024.
- L. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2021.
- M. UL 103 - Factory-Built Chimneys for Residential Type and Building Heating Appliances; Current Edition, Including All Revisions.
- N. UL 441 - Standard for Gas Vents; Current Edition, Including All Revisions.
- O. UL 959 - Medium Heat Appliance Factory Built Chimneys; Current Edition, Including All Revisions.
- P. UL 1738 - Standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV; Current Edition, Including All Revisions.

1.04 DEFINITIONS

- A. Breeching: Vent connector.
- B. Vent: That portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.
- C. Vent Connector: That part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent, and may include a draft control device.

PART 2 PRODUCTS

2.01 BREECHINGS, CHIMNEYS, AND STACKS - GENERAL REQUIREMENTS

- A. Regulatory Requirements:
 - 1. Comply with applicable codes for installation of propane burning appliances and equipment.
 - 2. Factory-built vents and chimneys used for venting natural draft appliances to comply with NFPA 211 and UL listed and labeled.

2.02 MANUFACTURED BREECHINGS

- A. Provide factory-built, modular connector and manifold system, tested to UL 103 with positive pressure rating.
- B. Assembly to be UL listed for use with building equipment in accordance with NFPA 211.
- C. Fabricate with 1-inch (25 mm) minimum body soluble fiber insulation between walls, and construct inner liner of 20-gauge, 0.0375-inch (0.95 mm) 304 stainless steel and outer jacket of 24-gauge, 0.0239-inch (0.61 mm) aluminized steel.
 - 1. Protect aluminized steel surfaces exposed to elements with a minimum of one base coat of primer and one finish coat of corrosion-resistant paint suitable for outer jacket skin temperatures of application.
- D. Design, fabricate, and install gastight to prevent products of combustion from leaking into building.
 - 1. Securely connect inner joints, and seal with factory-supplied overlapping V-bands and appropriate sealant in accordance with manufacturer's instructions.
 - 2. Design system to compensate for all flue-gas-induced thermal expansion.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.
- C. Rigidly support breechings from building structure with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12-foot (4 m) spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA (DCS) for equivalent duct support configuration and size.
- D. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.

END OF SECTION

**SECTION 235533
FUEL-FIRED UNIT HEATERS**

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 230513 - Common Motor Requirements for HVAC Equipment: Fan motors.
- B. Section 230713 - Duct Insulation: Duct liner.
- C. Section 233100 - HVAC Ducts and Casings.
- D. Section 235100 - Breechings, Chimneys, and Stacks.
- E. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.02 REFERENCE STANDARDS

- A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. ASHRAE Std 103 - Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers; 2022.
- C. NFPA 54 - National Fuel Gas Code; 2021.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- F. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2021.
- G. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; 2024.
- H. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's literature and data indicating rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- C. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.04 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturers warranty for heat exchangers.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with NFPA 70.
- B. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

2.02 GAS FIRED UNIT HEATERS

- A. Unit Heaters: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heat exchanger, burner, controls, and accessories:
 - 1. Heating: Propane gas fired.
 - 2. Discharge Louvers: Individually adjustable horizontal and vertical louvers to match cabinet finish.

- B. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors, glass fiber insulation and reflective liner.
- C. Supply Fan: Propeller type with direct drive, variable pitch motor pulley.
- D. Heat Exchanger: Aluminized steel welded construction.
- E. Gas Burner:
 - 1. Atmospheric type with adjustable combustion air supply.
 - 2. Gas valve, two stage provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
 - 3. Electronic pilot ignition, with electric spark igniter.
- F. Gas Burner Safety Controls:
 - 1. Thermocouple Sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
 - 2. Vent Safety Shutoff Sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
- G. Operating Controls:
 - 1. Room Thermostat: Cycles burner to maintain room temperature setting.
- H. Performance:
 - 1. Ratings: Energy Efficiency Rating (EER)/Coefficient of Performance (COP) not less than requirements of ASHRAE Std 90.1 I-P; seasonal efficiency to ASHRAE Std 103.
 - 2. Refer to Furnace Schedule. Gas heating capacities are sea level ratings.

2.03 ROOM THERMOSTATS

- A. Manufacturers:
- B. Room Thermostat: Adjustable, low voltage, to control burner operation, compressor and condenser fan and supply fan to maintain temperature setting. Include system selector switch (heat-off-cool) and fan control switch (auto-on).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that space is ready for installation of units and openings are as indicated on shop drawings.
- B. Verify that proper power supply is available.
- C. Verify that proper fuel supply is available for connection.

3.02 INSTALLATION

- A. Install in accordance with NFPA 90A.
- B. Install gas fired units in accordance with NFPA 54 and applicable codes.
- C. Provide vent connections in accordance with NFPA 211. Refer to Section 235100.

3.03 SCHEDULES

END OF SECTION

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

- B. Related Requirements:

1. Section 260513 "Medium-Voltage Cables" for single-conductor and multiconductor cables, cable splices, and terminations for electrical distribution systems with 2001 to 35,000 V.
2. Section 271500 "Communications Horizontal Cabling" for cabling used for voice and data circuits.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

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, provide products by the following:
 1. [Alcan Products Corporation; Alcan Cable Division.](#)
 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-2-THWN-2 or Type XHHW-2.
- D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC and Type SO with ground wire.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by 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. [3M](#); Electrical Markets Division.
 7. [Tyco Electronics.](#)
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

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.
- B. Comply with NFPA 70.

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. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN-2-THWN-2, single conductors in raceway.

- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-2-THWN-2, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-2-THWN-2, single conductors in raceway.
- E. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-2-THWN-2, single conductors in raceway.
- F. Branch Circuits Installed below Raised Flooring: Type THHN-2-THWN-2, single conductors in raceway.
- G. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. 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.
- C. 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.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "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. Perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- B. 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.
- C. 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 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: Grounding systems and equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently 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 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.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 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, pressure type with at least two bolts.
 1. Pipe Connectors: Clamp type, sized for pipe.
- 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.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 1. Bury at least 24 inches below grade.
- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.

E. 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.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
 5. Three-phase motor and appliance branch circuits.
 6. Flexible raceway runs.
 7. Armored and metal-clad cable runs.
 8. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

- E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- G. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
 - 1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.
 - 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- H. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

D. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.

3.5 LABELING

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems" for instruction signs. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
 1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.6 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test

wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.

- a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- B. Grounding system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohms.
 5. Pad-Mounted Equipment: 5 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

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 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.
- B. Related Sections include the following:
 - 1. Section 260548 "Vibration and Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- 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.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:

1. Steel slotted support systems.
 2. Nonmetallic slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
1. Trapeze hangers. Include Product Data for components.
 2. Steel slotted channel systems. Include Product Data for components.
 3. Equipment supports.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Comply with NFPA 70.

1.8 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. These items are specified in Section 077200 "Roof Accessories."

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. Manufacturers: Subject to compliance with requirements, provide products by one of 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 and malleable-iron 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. Manufacturers: Subject to compliance with requirements, provide products by one of 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, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of 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.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

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 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 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.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in 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.

- D. 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: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
 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.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "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 electrical materials and equipment.
- C. 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" 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 Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Surface raceways.
5. Boxes, enclosures, and cabinets.
6. Handholes and boxes for exterior underground cabling.

- B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

1.3 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.
- C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. [AFC Cable Systems, Inc.](#)
2. [Allied Tube & Conduit; a Tyco International Ltd. Co.](#)
3. [Electri-Flex Company.](#)
4. [Republic Conduit.](#)
5. [Southwire Company.](#)
6. [Thomas & Betts Corporation.](#)
7. [Western Tube and Conduit Corporation.](#)
8. [Wheatland Tube Company; a division of John Maneely Company.](#)

- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. IMC: Comply with ANSI C80.6 and UL 1242.
- E. PVC-Coated Steel Conduit: PVC-coated IMC.
1. Comply with NEMA RN 1.
 2. Coating Thickness: 0.040 inch, minimum.
- F. EMT: Comply with ANSI C80.3 and UL 797.
- G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Setscrew or compression.
 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- I. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. [Manufacturers](#): Subject to compliance with requirements, provide products by the following:
1. [AFC Cable Systems, Inc.](#)
 2. [Anamet Electrical, Inc.](#)
 3. [CANTEX Inc.](#)

4. [Condux International, Inc.](#)
 5. [Electri-Flex Company.](#)
 6. [Lamson & Sessions; Carlon Electrical Products.](#)
 7. [RACO; a Hubbell company.](#)
 8. [Thomas & Betts Corporation.](#)
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. ENT: Comply with NEMA TC 13 and UL 1653.
- D. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- E. LFNC: Comply with UL 1660.
- F. Rigid HDPE: Comply with UL 651A.
- G. RTRC: Comply with UL 1684A and NEMA TC 14.
- H. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- I. Fittings for LFNC: Comply with UL 514B.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. [Manufacturers:](#) Subject to compliance with requirements, provide products by the following:
1. [Cooper B-Line, Inc.](#)
 2. [Hoffman; a Pentair company.](#)
 3. [Mono-Systems, Inc.](#)
 4. [Square D; a brand of Schneider Electric.](#)
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Mono-Systems, Inc.
 - b. Panduit Corp.
 - c. Wiremold / Legrand.

2.5 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Cooper Technologies Company; Cooper Crouse-Hinds.
 - 2. EGS/Appleton Electric.
 - 3. Erickson Electrical Equipment Company.
 - 4. FSR Inc.
 - 5. Hoffman; a Pentair company.
 - 6. Hubbell Incorporated; Killark Division.
 - 7. Milbank Manufacturing Co.
 - 8. RACO; a Hubbell Company.
 - 9. Spring City Electrical Manufacturing Company.
 - 10. Thomas & Betts Corporation.
 - 11. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- F. Metal Floor Boxes:
 - 1. Material: sheet metal.
 - 2. Type: Fully adjustable.
 - 3. Shape: Rectangular.
 - 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- G. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- J. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- K. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- L. Gangable boxes are prohibited.
- M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Nonmetallic Enclosures: Plastic.
 - 3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- N. Cabinets:
 - 1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.6 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
 - 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of fiberglass.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. [Armorcast Products Company.](#)
 - b. [Carson Industries LLC.](#)

- c. CDR Systems Corporation; Hubbell Power Systems.
 - d. NewBasis.
 - e. Nordic Fiberglass, Inc.
 - f. Oldcastle Precast, Inc.; Christy Concrete Products.
 - g. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
- 2. Standard: Comply with SCTE 77.
 - 3. Color of Frame and Cover: Green.
 - 4. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
 - 5. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 6. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 7. Cover Legend: Molded lettering, "ELECTRIC."
 - 8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.7 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

- A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
 - 1. Tests of materials shall be performed by an independent testing agency.
 - 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 - 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: IMC.
 - 2. Concealed Conduit, Aboveground: RNC, Type EPC-40-PVC.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
 - 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT or RNC.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: IMC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.

- c. Mechanical rooms.
 - d. Gymnasiums.
- 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
- 5. Damp or Wet Locations: IMC.
- 6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 1/2-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
 - 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.
- H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 1 inch of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from ENT to IMC before rising above floor.
- J. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- R. 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.

- S. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- U. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- Z. Locate boxes so that cover or plate will not span different building finishes.
- AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- CC. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified in Section 312000 "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
 - a.
5. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- 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, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.
- F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 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."

3.6 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

- A. Protect coatings, finishes, and cabinets 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 260533

SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS 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. This Section includes the following:
 - 1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct banks, and in single duct runs.
 - 2. Handholes and boxes.

1.3 DEFINITION

- A. RNC: Rigid nonmetallic conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Duct-bank materials, including separators and miscellaneous components.
 - 2. Ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
 - 3. Accessories for manholes, handholes, boxes, and other utility structures.
 - 4. Warning tape.
- B. Shop Drawings for Factory-Fabricated Handholes and Boxes Other Than Precast Concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
 - 1. Duct entry provisions, including locations and duct sizes.
 - 2. Cover design.
 - 3. Grounding details.
 - 4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.5 INFORMATIONAL SUBMITTALS

- A. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.

1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
 2. Drawings shall be signed and sealed by a qualified professional engineer.
- B. Source quality-control test reports.
- C. Field quality-control test reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Comply with ANSI C2.
- C. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.
- B. Store precast concrete and other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.
- C. Lift and support precast concrete units only at designated lifting or supporting points.

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
1. Notify Construction Manager no fewer than five days in advance of proposed interruption of electrical service.
 2. Do not proceed with interruption of electrical service without Construction Manager's written permission.

1.9 COORDINATION

- A. Coordinate layout and installation of ducts, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field.
- B. Coordinate elevations of ducts and duct-bank entrances into handholes, and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.

PART 2 - PRODUCTS

2.1 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. RNC: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.2 NONMETALLIC DUCTS AND DUCT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. [ARNCO Corp.](#)
 - 2. [Beck Manufacturing.](#)
 - 3. [Cantex, Inc.](#)
 - 4. [CertainTeed Corp.; Pipe & Plastics Group.](#)
 - 5. [Condux International, Inc.](#)
 - 6. [ElecSys, Inc.](#)
 - 7. [Electri-Flex Company.](#)
 - 8. [IPEX Inc.](#)
 - 9. [Lamson & Sessions; Carlon Electrical Products.](#)
 - 10. [Manhattan/CDT; a division of Cable Design Technologies.](#)
 - 11. [Spiraduct/AFC Cable Systems, Inc.](#)
- B. Underground Plastic Utilities Duct: NEMA TC 6 & 8, Type EB-20-PVC, ASTM F 512, UL 651A, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 9.
- C. Underground Plastic Utilities Duct: NEMA TC 6 & 8, Type DB-60-PVC, ASTM F 512, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 9.
- D. Duct Accessories:
 - 1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
 - 2. Warning Tape: Underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

2.3 HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

- A. Description: Comply with SCTE 77.
 - 1. Color: Green.
 - 2. Configuration: Units shall be designed for flush burial and have open bottom, unless otherwise indicated.

3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 5. Cover Legend: Molded lettering, as indicated for each service.
 6. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
 7. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.
- B. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with covers of fiberglass.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Carson Industries LLC.](#)
 - b. [Christy Concrete Products.](#)
 - c. [Nordic Fiberglass, Inc.](#)

2.4 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.
- B. Nonconcrete Handhole and Pull-Box Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
 1. Tests of materials shall be performed by a independent testing agency.
 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or the manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 UNDERGROUND DUCT APPLICATION

- A. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.
- B. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.
- C. Underground Ducts for Telephone, Communications, or Data Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.
- D. Underground Ducts Crossing Paved Paths and Driveways: RNC, NEMA Type EPC-40-PVC, encased in reinforced concrete.

3.2 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Boxes for 600 V and Less, Including Telephone, Communications, and Data Wiring:
 - 1. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Fiberglass-reinforced polyester resin, SCTE 77, Tier 15 structural load rating.
 - 2. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: High-density plastic, SCTE 77, Tier 8 structural load rating.
 - 3. Units Subject to Light-Duty Pedestrian Traffic Only: High-density plastic, structurally tested according to SCTE 77 with 3000-lbf vertical loading.

3.3 EARTHWORK

- A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."
- D. Cut and patch existing pavement in the path of underground ducts and utility structures according to Section 017329 "Cutting and Patching."

3.4 DUCT INSTALLATION

- A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.
- B. 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.
- C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- D. Duct Entrances to Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.
 - 1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line.
 - 2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.

3. Grout end bells into structure walls from both sides to provide watertight entrances.
- E. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit 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 duct-to-conduit transition. Install conduit penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.
- G. Pulling Cord: Install 100-lbf- test nylon cord in ducts, including spares.
- H. Direct-Buried Duct Banks:
 1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
 2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.
 3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Section 312000 "Earth Moving" for pipes less than 6 inches in nominal diameter.
 4. Install backfill as specified in Section 312000 "Earth Moving."
 5. After installing first tier of ducts, 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 ducts 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 as specified in Section 312000 "Earth Moving."
 6. Install ducts with a minimum of 3 inches between ducts for like services and 6 inches between power and signal ducts.
 7. Depth: Install top of duct bank at least 36 inches below finished grade, unless otherwise indicated.
 8. Set elevation of bottom of duct bank below the frost line.
 9. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
 10. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
 - b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

3.5 INSTALLATION OF CONCRETE MANHOLES, 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 ducts 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 the frost line.
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. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

D. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.

E. Field-Installed Bolting Anchors in Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

F. Warning Sign: Install "Confined Space Hazard" warning sign on the inside surface of each manhole cover.

3.6 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 ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the 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 so cover surface will be flush with finished grade. Set covers of other handholes 1 inch above finished grade.

D. Install handholes and boxes with bottom below the frost line.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

- F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.7 GROUNDING

- A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
 - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
 - 2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
 - 3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.9 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 260543

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 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 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- 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.

1.4 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. Colors for Raceways Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING."
- D. 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.
- E. 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.
- F. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

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. Colors for Cables Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER HIGH VOLTAGE WIRING."

- D. 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.
- E. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.
- F. 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. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
- G. 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.

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: Write-on, 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. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- E. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Labels for Tags: Self-adhesive label, machine-printed with permanent, waterproof, black ink recommended by printer manufacturer, sized for attachment to tag.

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 electrical and communications utility 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.
 - 3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

2.7 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. 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.
- C. 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 42 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. 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. General-Purpose Cable Ties: Fungus inert, 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 except where used for color-coding.
- B. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
 1. Minimum Width: 3/16 inch.
 2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
 3. UL 94 Flame Rating: 94V-0.
 4. Temperature Range: Minus 50 to plus 284 deg F.
 5. 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. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- 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 90 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 and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder 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. Power-Circuit Conductor Identification, More than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use write-on tags.
- F. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- G. 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.

- H. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive vinyl labels with the conductor designation.
- I. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
- J. 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.
- K. 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.
- L. 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.
- M. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
 - 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.
- N. 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.
- O. 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.
- P. 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: 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 engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Switchboards.
- e. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- f. Substations.
- g. Emergency system boxes and enclosures.
- h. Enclosed switches.
- i. Enclosed circuit breakers.
- j. Enclosed controllers.
- k. Variable-speed controllers.
- l. Push-button stations.
- m. Power transfer equipment.
- n. Contactors.
- o. Remote-controlled switches, dimmer modules, and control devices.
- p. Battery-inverter units.
- q. Battery racks.
- r. Power-generating units.
- s. Monitoring and control equipment.
- t. UPS equipment.

END OF SECTION 260553

SECTION 262416 - PANELBOARDS

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. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

- A. SVR: Suppressed voltage rating.
- B. TVSS: Transient voltage surge suppressor.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. 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. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 6. Include wiring diagrams for power, signal, and control wiring.
 - 7. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Field Quality-Control Reports:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- C. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

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. Keys: Two spares for each type of panelboard cabinet lock.
 - 2. Circuit Breakers Including GFCI and Ground Fault Equipment Protection (GFEP) Types: Two spares for each panelboard.
 - 3. Fuses for Fused Switches: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- C. 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.

- D. 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.
- E. Comply with NEMA PB 1.
- F. Comply with NFPA 70.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Handle and prepare panelboards for installation according to NEMA PB 1.

1.10 PROJECT CONDITIONS

- A. 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 Construction Manager no fewer than five days in advance of proposed interruption of electric service.
 - 2. Do not proceed with interruption of electric service without Construction Manager's written permission.
 - 3. Comply with NFPA 70E.

1.11 COORDINATION

- 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. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.12 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices 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 REQUIREMENTS FOR PANELBOARDS

- A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- B. Enclosures: Flush- and surface-mounted cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R.
 - c. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
 - d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
 - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
 - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
 - 4. Finishes:
 - a. Panels and Trim: 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.
 - 5. Directory Card: Inside panelboard door, mounted in metal frame with transparent protective cover.
- C. Incoming Mains Location: Top and bottom.
- D. Phase, Neutral, and Ground Buses:
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
- E. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Main and Neutral Lugs: Mechanical type.
 - 3. Ground Lugs and Bus-Configured Terminators: Mechanical type.
- F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. [Eaton Electrical Inc.; Cutler-Hammer Business Unit.](#)
 - 2. [General Electric Company; GE Consumer & Industrial - Electrical Distribution.](#)
 - 3. [Siemens Energy & Automation, Inc.](#)
 - 4. [Square D; a brand of Schneider Electric.](#)
- B. Panelboards: NEMA PB 1, power and feeder distribution type.
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inches high, provide two latches, keyed alike.
- D. Mains: As indicated on drawings.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.
- G. Contactors in Main Bus: NEMA ICS 2, Class A, electrically held, general-purpose controller, with same short-circuit interrupting rating as panelboard.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. [Eaton Electrical Inc.; Cutler-Hammer Business Unit.](#)
 - 2. [General Electric Company; GE Consumer & Industrial - Electrical Distribution.](#)
 - 3. [Siemens Energy & Automation, Inc.](#)
 - 4. [Square D; a brand of Schneider Electric.](#)
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: As indicated on drawings.
- D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- F. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. [Eaton Electrical Inc.; Cutler-Hammer Business Unit.](#)
 2. [General Electric Company; GE Consumer & Industrial - Electrical Distribution.](#)
 3. [Siemens Energy & Automation, Inc.](#)
 4. [Square D; a brand of Schneider Electric.](#)
- B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with series-connected rating to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. 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. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
 - a. Instantaneous trip.
 - b. Long- and short-time pickup levels.
 - c. Long- and short-time time adjustments.
 - d. Ground-fault pickup level, time delay, and I^2t response.
 4. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
 5. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
 6. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
 7. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
 - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - e. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
 - f. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
 - g. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts and "b" contacts operate in reverse of circuit-breaker contacts.
 - h. Alarm Switch: Single-pole, normally open contact that actuates only when circuit breaker trips.

- i. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
- j. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function with other upstream or downstream devices.
- k. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.

2.5 PANELBOARD SUPPRESSORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. [Current Technology; a subsidiary of Danahar Corporation.](#)
- 2. [Eaton Electrical Inc.; Cutler-Hammer Business Unit.](#)
- 3. [General Electric Company; GE Consumer & Industrial - Electrical Distribution.](#)
- 4. [Liebert Corporation.](#)
- 5. [Siemens Energy & Automation, Inc.](#)
- 6. [Square D; a brand of Schneider Electric.](#)

- B. Surge Protection Device: IEEE C62.41-compliant, integrally mounted, solid-state, parallel-connected, non-modular type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the panelboard short-circuit rating, and with the following features and accessories:

- 1. Accessories:
 - a. LED indicator lights for power and protection status.
 - b. Audible alarm, with silencing switch, to indicate when protection has failed.
 - c. One set of dry contacts rated at 5 A and 250-V ac, for remote monitoring of protection status.
- 2. Peak Single-Impulse Surge Current Rating: 120 kA per mode/240 kA per phase.
- 3. Minimum single-impulse current ratings, using 8-by-20-mic.sec. waveform described in IEEE C62.41.2.
 - a. Line to Neutral: 70,000A.
 - b. Line to Ground: 70,000A.
 - c. Neutral to Ground: 50,000A.
- 4. Protection modes and UL 1449 SVR for grounded wye circuits with 208Y/120-V, three-phase, four-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V for 208Y/120.
 - b. Line to Ground: 400 V for 208Y/120.
 - c. Neutral to Ground: 400 V for 208Y/120.

2.6 ACCESSORY COMPONENTS AND FEATURES

- A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

- B. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard. Include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.
- B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Equipment Mounting: Install floor mounted panelboards on concrete bases, 4-inch nominal thickness. Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete."
 - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around full perimeter of base.
 - 2. For panelboards, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to panelboards.
 - 5. Attach panelboard to the vertical finished or structural surface behind the panelboard.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- D. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."
- E. Mount top of trim 90 inches above finished floor unless otherwise indicated.
- F. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- G. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit-breaker trip ranges.

- H. Install filler plates in unused spaces.
- I. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- J. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.
- K. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 260553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- 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 distribution panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 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 inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. 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.
- D. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- E. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. 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.
3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
 - c. Instruments and Equipment:
 - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

F. Panelboards will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges as indicated.

3.6 PROTECTION

- A. Temporary Heating: 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. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Twist-locking receptacles.
 - 3. Tamper-resistant receptacles.
 - 4. Weather-resistant receptacles.
 - 5. Snap switches and wall-box dimmers.
 - 6. Wall-switch and exterior occupancy sensors.
 - 7. Communications outlets.
 - 8. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. TVSS: Transient voltage surge suppressor.
- F. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.6 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.7 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 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 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 application.
- B. Comply with NFPA 70.
- C. 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 the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

- a. [Cooper; 5351 \(single\), CR5362 \(duplex\).](#)
 - b. [Hubbell; HBL5351 \(single\), HBL5352 \(duplex\).](#)
 - c. [Leviton; 5891 \(single\), 5352 \(duplex\).](#)
 - d. [Pass & Seymour; 5361 \(single\), 5362 \(duplex\).](#)
- B. Tamper-Resistant Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement sd, and FS W-C-596.
 - 1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [Cooper; TR8300.](#)
 - b. [Hubbell; HBL8300SGA.](#)
 - c. [Leviton; 8300-SGG.](#)
 - d. [Pass & Seymour; TR63H.](#)
 - 2. Description: Labeled shall comply with NFPA 70, "Health Care Facilities" Article, "Pediatric Locations" Section.

2.4 GFCI RECEPTACLES

- A. General Description:
 - 1. Straight blade, feed-through type.
 - 2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
 - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 - 1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [Cooper; VGF20.](#)
 - b. [Hubbell; GFR5352L.](#)
 - c. [Pass & Seymour; 2095.](#)
 - d. [Leviton; 7590.](#)
- C. Tamper-Resistant GFCI Convenience Receptacles, 125 V, 20 A:
 - 1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [Hubbell; GFTR20.](#)
 - b. [Pass & Seymour; 2095TR.](#)

2.5 TWIST-LOCKING RECEPTACLES

- A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.
 - 1. **Products:** Subject to compliance with requirements, provide one of the following:

- a. Cooper; CWL520R.
- b. Hubbell; HBL2310.
- c. Leviton; 2310.
- d. Pass & Seymour; L520-R.

2.6 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

1) Single Pole:

- a) Cooper; AH1221.
- b) Hubbell; HBL1221.
- c) Leviton; 1221-2.
- d) Pass & Seymour; CSB20AC1.

2) Two Pole:

- a) Cooper; AH1222.
- b) Hubbell; HBL1222.
- c) Leviton; 1222-2.
- d) Pass & Seymour; CSB20AC2.

3) Three Way:

- a) Cooper; AH1223.
- b) Hubbell; HBL1223.
- c) Leviton; 1223-2.
- d) Pass & Seymour; CSB20AC3.

4) Four Way:

- a) Cooper; AH1224.
- b) Hubbell; HBL1224.
- c) Leviton; 1224-2.
- d) Pass & Seymour; CSB20AC4.

2.7 WALL-BOX DIMMERS

A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.

B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.

2.8 WALL PLATES

A. 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: White thermoplastic.
 3. Material for Kitchen Spaces: Stainless-steel
 4. Material for Unfinished Spaces: Galvanized steel.
 5. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.9 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: Rectangular, solid brass with satin finish.
- D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
- E. Voice and Data Communication Outlet: Two modular, keyed, color-coded, RJ-45 jacks for UTP cable complying with requirements in Section 271500 "Communications Horizontal Cabling."

2.10 SERVICE POLES

- A. Description:
 1. Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
 2. Poles: Nominal 2.5-inch- square cross section, with height adequate to extend from floor to at least 6 inches above ceiling, and with separate channels for power wiring and voice and data communication cabling.
 3. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
 4. Finishes: Manufacturer's standard painted finish and trim combination.
 5. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors and a minimum of four, four-pair, Category 3 or Category 5 voice and data communication cables.
 6. Power Receptacles: Two duplex, 20-A, straight-blade receptacles complying with requirements in this Section.
 7. Voice and Data Communication Outlets: Blank insert with bushed cable opening complying with requirements in Section 271500 "Communications Horizontal Cabling."

2.11 FINISHES

- A. Device Color:

1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by NFPA 70 or device listing.
 2. Wiring Devices Connected to Emergency Power System: Red.
- B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. 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.
- C. 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 meet provisions of 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. Pigtailling existing conductors is permitted, provided the outlet box is large enough.
- D. 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.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. 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.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. 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.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:

1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
2. Test Instruments: Use instruments that comply with UL 1436.
3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Convenience 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.

C. Wiring device will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 265100 - INTERIOR LIGHTING

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. Interior lighting fixtures, lamps, and ballasts.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.
- B. Related Sections:
 - 1. Section 262726 "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CCT: Correlated color temperature.
- C. CRI: Color-rendering index.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.4 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.
 - a. 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. Shop Drawings: For nonstandard or custom lighting fixtures. 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.
- C. Installation instructions.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.
- B. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, from manufacturer.
- C. Field quality-control reports.
- D. Warranty: Sample of special warranty.

1.6 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.

1.7 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.

1.8 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. Comply with NFPA 70.

1.9 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.

1.10 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, provide product 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. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- 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.

2.3 EMERGENCY FLUORESCENT POWER UNIT

- A. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Comply with UL 924.
 - 1. Nightlight Connection: Operate one fluorescent lamp continuously.
 - 2. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
 - a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - 3. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - 4. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
 - 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.
- B. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more fluorescent lamps, remote mounted from lighting fixture. Comply with UL 924.
 - 1. Emergency Connection: Operate one fluorescent lamp continuously. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
 - 2. Nightlight Connection: Operate one fluorescent lamp in a remote fixture continuously.
 - 3. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - 4. Charger: Fully automatic, solid-state, constant-current type.
 - 5. Housing: NEMA 250, Type 1 enclosure.
 - 6. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - 7. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - 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.

2.4 EMERGENCY LIGHTING UNITS

- A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.
 - 1. Battery: Sealed, maintenance-free, lead-acid type.
 - 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - 3. 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.

4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
6. 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 (13-mm)** steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, **1/2-inch (13-mm)** 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 (2.68 mm)**
- E. Rod Hangers: **3/16-inch (5-mm)** 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. Install lamps in each luminaire.
- 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, independent of the ceiling suspension devices, for each fixture. Locate not more than **6 inches (150 mm)** 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 (20-mm)** 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 (1200 mm)**, 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."

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 STARTUP SERVICE

- A. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.

3.5 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 265600 - EXTERIOR LIGHTING

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. Exterior luminaires with lamps and ballasts.
 - 2. Poles and accessories.

- B. Related Sections:

- 1. Section 265100 "Interior Lighting" for exterior luminaires normally mounted on exterior surfaces of buildings.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color-rendering index.
- C. LER: Luminaire efficacy rating.
- D. Luminaire: Complete lighting fixture, including ballast housing if provided.
- E. Pole: Luminaire support structure, including tower used for large area illumination.
- F. Standard: Same definition as "Pole" above.

1.4 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

- A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.
- B. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.
 - 1. Basic wind speed for calculating wind load for poles exceeding 49.2 feet (15 m) in height is 110 mph.

1.5 ACTION SUBMITTALS

- A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
 - 2. Details of attaching luminaires and accessories.
 - 3. Details of installation and construction.
 - 4. Luminaire materials.
 - 5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.
 - a. Manufacturer Certified Data: Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
 - 6. Photoelectric relays.
 - 7. Ballasts, including energy-efficiency data.
 - 8. Lamps, including life, output, CCT, CRI, lumens, and energy-efficiency data.
 - 9. Materials, dimensions, and finishes of poles.
 - 10. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
 - 11. Anchor bolts for poles.
- B. Shop Drawings: 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. Anchor-bolt templates keyed to specific poles and certified by manufacturer.

1.6 INFORMATIONAL SUBMITTALS

- A. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements in AASHTO LTS-4-M and that load imposed by luminaire and attachments has been included in design. The certification shall be based on design calculations by a professional engineer.
- B. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.
- C. Field quality-control reports.
- D. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and poles to include in emergency, operation, and maintenance manuals.

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.

1.9 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. Comply with IEEE C2, "National Electrical Safety Code."
- D. Comply with NFPA 70.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Package aluminum poles for shipping according to ASTM B 660.
- B. Store poles on decay-resistant-treated skids at least **12 inches (300 mm)** above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.
- C. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.
 - 1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
 - 2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
 - 3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
 - 4. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

- A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
- B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
- F. 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. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.
- G. Exposed Hardware Material: Stainless steel.
- H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.
- J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
- K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
- L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

- M. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
 - a. Color: As selected from manufacturer's standard catalog of colors.

2.3 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

- A. Comply with UL 773 or UL 773A.
1. Relay with locking-type receptacle shall comply with ANSI C136.10.
 2. Adjustable window slide for adjusting on-off set points.

2.4 GENERAL REQUIREMENTS FOR POLES AND SUPPORT COMPONENTS

- A. Structural Characteristics: Comply with AASHTO LTS-4-M.
1. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in "Structural Analysis Criteria for Pole Selection" Article.
 2. Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.
- B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.
- C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.
1. Materials: Shall not cause galvanic action at contact points.
 2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
 3. Anchor-Bolt Template: Plywood or steel.
- D. Handhole: Oval-shaped, with minimum clear opening of 2-1/2 by 5 inches (65 by 130 mm), with cover secured by stainless-steel captive screws.
- E. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Section 033000 "Cast-in-Place Concrete."

- F. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according to ASTM A 123/A 123M; and with top-plate and mounting bolts to match pole base flange and strength required to support pole, luminaire, and accessories.

2.5 STEEL POLES

- A. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig (317 MPa); one-piece construction up to 40 feet (12 m) in height with access handhole in pole wall.
 - 1. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.
- B. Brackets for Luminaires: Detachable, cantilever, without underbrace.
 - 1. Adapter fitting welded to pole, allowing the bracket to be bolted to the pole mounted adapter, then bolted together with stainless-steel bolts.
 - 2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire.
 - 3. Match pole material and finish.
- C. Steps: Fixed steel, with nonslip treads, positioned for 15-inch (381-mm) vertical spacing, alternating on opposite sides of pole; first step at elevation 10 feet (3 m) above finished grade.
- D. Grounding and Bonding Lugs: Welded 1/2-inch (13-mm) threaded lug, complying with requirements in Section 260526 "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.
- E. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.
- F. Platform for Lamp and Ballast Servicing: Factory fabricated of steel with finish matching that of pole.
- G. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or with SSPC-SP 8, "Pickling."
 - 2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
 - 3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

- A. Install lamps in each luminaire.
- B. Fasten luminaire to indicated structural supports.
 - 1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

3.2 POLE INSTALLATION

- A. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.
- B. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Section 033000 "Cast-in-Place Concrete."
- C. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.
 - 1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
 - 2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
 - 3. Install base covers unless otherwise indicated.
 - 4. Use a short piece of 1/2-inch- (13-mm-) diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.
- D. Poles and Pole Foundations Set in Concrete Paved Areas: Install poles with minimum of 6-inch- (150-mm-) wide, unpaved gap between the pole or pole foundation and the edge of adjacent concrete slab. Fill unpaved ring with pea gravel to a level 1 inch (25 mm) below top of concrete slab.
- E. Raise and set poles using web fabric slings (not chain or cable).

3.3 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- (0.254-mm-) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 GROUNDING

- A. Ground metal poles and support structures according to Section 260526 "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding electrode for each pole unless otherwise indicated.
 - 2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
- B. Ground nonmetallic poles and support structures according to Section 260526 "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding electrode for each pole.

3.5 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
 - 1. Verify operation of photoelectric controls.
- C. 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.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaire lowering devices.

END OF SECTION 265600

SECTION 331416
POTABLE WATER PIPELINE AND APPURTENANCES

DESCRIPTION

331416-1.1 This Item shall consist of providing and installing potable water main, complete and in place at the locations and to the lines and grades shown in the Construction Plans and the Town of Mammoth Lakes Standard Plans and as specified in these specifications and in the Mammoth Community Water District (MCWD) Water Code, and as directed by the Resident Project Representative (RPR).

MATERIALS

331416-2.1 PIPELINE. Unless noted otherwise, pipelines shall be Polyvinyl Chloride (PVC) pipe conforming to AWWA C900 Class 235 DR 18. Joining of PVC pipe shall be with elastomeric-gasket bell ends or couplings. The bell ends shall be an integral thickened bell end (IB) or an integral Sleeve-reinforced bell end. The bell end joints shall have a minimum wall thickness of the bell or Sleeve-reinforced bell equal, at all points, to the DR Requirements for the pipe. The minimum wall thickness in the ring groove and bell-entry sections shall equal or exceed the minimum wall thickness of the pipe barrel. If bell ends are not part of the pipe, one PVC coupling, manufactured of the same material and by the same manufacturer as the pipe, shall be furnished with each length of pipe together with two (2) rubber rings. The coupling shall be designed to ensure a water-tight joint with the pipe. The coupling body and socket shall have a wall thickness equal to the pipe barrel thickness with which the coupling is to be used. All rubber rings shall be furnished by the pipe manufacturer. These rubber rings (Elastomeric Gaskets) shall be manufactured to conform with the requirements of ASTM F-477.

HDPE pipelines shall conform with AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing.

331416-2.2 FITTINGS. Fittings shall be ductile iron conforming to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53, Class 350 for push-on fittings and Class 250 for flanged fittings or Class 350 for mechanical joints as called for in the Construction Plans. Fittings may be coated with either cement lined with asphalt coating in accordance with Section 4.3 of ANSI/AWWA C153/a21.53 or fusing bonded epoxy in accordance with ANSI/AWWA C116/A21.16. Flanged fitting shall be provided and installed with gaskets. Flanges for mechanical joint fittings shall be compatible with flanges for pipe and pups.

331416-2.3 VALVES. Valves shall be non-rising stem resilient seat gate valves conforming to AWWA Standard C509 and C-550. Valve bodies shall be ductile iron and wedges shall be fully rubber encapsulated.

The stem shall have two O-rings above the collar and one O-ring below the collar. Stem seals must be replaceable with the valve under pressure. The stem material shall be stainless steel (ANSI-420), low zinc bronze or manganese bronze. The waterway shall be full size. No cavities or depressions are permitted in the seat area. Valve body and bonnet shall be electrostatically applied, fusion bonded, epoxy coated both inside and out by the valve manufacturer. The coating shall meet the requirements of AWWA C-550 or C-515 Ductile Iron and NSF 61 approved. All valve body and bonnets bolts and nuts shall be type 304 stainless steel.

All valves must be tested by hydrostatic pressure equal to the requirements in the AWWA C-509 specifications prior to shipment.

Tapping gate valve assemblies shall be used only in conjunction with tapping Sleeves and shall be furnished and installed by the contractor.

Nuts and bolts used for bolting flanged-end gate valves to pipeline flanges above ground, shall be hexagonal head machine bolts and hexagonal nuts conforming to ASTM A307, Grade B. All buried flanged-end gate valves shall be bolted to the pipeline flanges with Ni-Cad nuts and bolts or approved equal.

331416-2.4 VALVE SERVICE CASINGS AND LIDS. Valve service casing and lids shall be cast iron Kearney Manufacturing Roll-in Frame No. KP 2050 and Rollin Cover No. KP 3050 or approved equal and shall be marked as shown on the Drawings.

331416-2.5 THRUST BLOCKS. Thrust blocks shall be Type II/V Portland cement concrete having minimum compression strength of 3,000 pounds per square inch (psi) and shall be installed in conformance with the details in the Construction Plans.

331416-2.6 TRACER WIRE. Tracer wire shall be copper, type TW, Size AWG #10.

331416-2.7 FIRE HYDRANTS. Fire hydrants shall be installed as shown in the details on the plans.

331416-2.8 BACKFLOW PREVENTION ASSEMBLIES. Backflow Prevention Assemblies shall be installed as shown in the details on the plans.

331416-2.9 WATER METERS. Water meters shall be installed as shown in the details on the plans.

331416-2.10 CONTRACTOR SUBMITTALS

The CONTRACTOR shall furnish the following to the OWNER:

- a. Certification of compliance for pipelines, fittings, valves, and valve service casings and lids
- b. Construction schedule
- c. Access and safety measures plan for Airport personnel and equipment.

CONSTRUCTION METHODS

331416-3.1 POTHOLE AND LOCATE. The location of the existing water main at the point of connection of the new pipeline to the existing pipeline is not exactly known. Therefore, the Contractor shall perform all exploratory work, including potholing and probing to locate and expose the existing water main to determine its location, depth, material, and materials, fittings, and work required to make the connection.

Potholing and locating the existing water main shall not be measured for direct payment. Performance with this Work shall be considered to as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.2 TRENCHING. The Contractor shall perform all excavation for the water main trench. The excavation shall be of sufficient size to place the water main, fittings, and valves and access existing pipelines at connection point. Trenching for water mains, fittings, and valves shall conform to the details shown in the plans.

Excavation shall not be measured for direct payment. Performance with this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.3 SHUTDOWN AND DEWATERING. The installation of this pipeline will require the shutdown of an existing water main to complete the installation of the new pipeline and connect it to the existing pipeline. The Contractor is fully responsible for working with the RPR to schedule the shutdown of the existing water main with the Airport and to notify any affected customers of the dates and length of the shutdown.

The existing pipeline shall not be shutdown more than once and the total length of time in which the line is shutdown shall not exceed 48 continuous hours. Liquidated damages of \$1000 per hour will be assessed for each and every hour that the shutdown of the existing pipeline that will remain in service (the portion of the pipeline that will not be demolished) exceeds the continuous 48 hours.

The Contractor shall provide all equipment, labor, materials, incidentals and perform all work necessary to shutdown and dewater the existing pipeline, including excavating and exposing water valves as necessary to

isolate the pipeline for shutdown, closing the valves, providing traffic control at locations where valves have been dug up, cutting the existing pipeline, and dewatering. Dewatering shall conform to the Airport's NPDES General Industrial Permit to discharge stormwater and to the requirements of local jurisdictions.

Shutdown and dewatering shall not be measured for direct payment. Performance with this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.4 INSTALLATION. Installation of pipes with restrained and unrestrained joints, fittings, valves, thrust blocks, tracer wire, and valve service casings, meters, backflow devices, and lids shall be performed in accordance the appropriate subsections of Chapter 7 of the AWWA C 605 and AWWA Manual M23 or other appropriate AWWA standards, and in accordance with the details in the Construction Plans and the pipe manufacturer's recommendations. Bending of PVC pipe to accomplish horizontal or vertical curves is not permitted.

See Section 331416-3.8 of these specifications regarding coordination of the installation with the Airport, scheduling, access, and safety requirements.

Installation of pipes, fittings, valves, thrust blocks, tracer wire, and valve service casings and lids shall not be measured for direct payment. Performance with this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.5 BACKFILLING. Backfill material and methods shall conform to the details shown in the plans. Backfill material shall be moisture conditioned, placed, and compacted in accordance with the plans. Minimum compaction requirement is 95 percent relative compaction.

Backfill shall be completed to be flush with the subgrade of the proposed pavement structural section for this area of the project.

Backfill shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.6 HYDROSTATIC PRESSURE TESTING. Pressure testing of the installed pipe, fittings, and valves shall be performed in accordance with Section 7.10(P)(7) of the MCWD Water Code.

Hydrostatic pressure testing shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.7 DISINFECTION. Disinfection of the installed pipe, fittings, and valves shall be performed in accordance with AWWA 601-54.

Disinfection shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.8 COORDINATION, SCHEDULING, ACCESS, AND SAFETY. The Contractor shall perform all work and provide all services required to coordinate the shutdown of the existing pipeline, the connection of the new pipeline to the existing pipeline with the Airport, and coordinate and schedule all trenching, lighting, safety walks, trench backfill and re-excavation with the RPR and Airport.

The Contractor shall schedule and coordinate with the Airport the installation of the new gate valve and meter on the existing water main and allow in his schedule time required for the Airport to perform this installation.

The Contractor shall perform all work required to prepare a schedule of the work, submit that schedule for review and approval by the RPR, and make changes to the schedule as agreed to between the Contractor and the RPR, except that the RPR shall have final say on the schedule and no work shall commence until the RPR

has approved the schedule. The Contractor shall make all changes and arrange workflow and scheduling so as to conform to the approved schedule.

The Contractor shall be aware that the construction work, will require a temporary opening in the Airport security fencing and will occur across the front of the Airport Rescue and Fire Fighting (ARFF) station. It is vitally important that perimeter security be maintained and access to and from the airfield be disrupted as little as physically possible. To that end, the Contractor shall include in the lump sum bid for this item all costs for compliance with the following requirements:

- a. 48 hours prior to starting construction, the Contractor shall notify the RPR of the start date and time.
- b. 48 hours prior to the start of construction, the Contractor shall obtain the approval of the RPR as to the means and methods for maintaining security at any openings in the security fencing and securing the opening during non-working hours.
- c. Contractor shall place and compact trench backfill for a minimum of 3 feet either side of the security fence as directed by the RPR to provide security during non-working hours even if the pipeline has not yet been installed in these locations. Contractor shall re-excavate the backfill at the security fence and the trench crossing during working hours as necessary to install the pipeline.

The Contractor shall adhere to all safety requirements for working on the Airport, including maintaining security at all temporary openings in the Airport security fence, adhering to employee security badging requirements, adhering to all debris and foreign object debris requirements, and providing full access to the Airport by ARFF personnel during the life of this project.

Coordination, scheduling, access, and security shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.9 TRAFFIC CONTROL. The Contractor shall provide, maintain, and remove traffic control as required by the Airport.

Traffic control within the security fence area shall consist of reflective delineators that direct emergency personnel to the trench crossings stabilized with temporary trench resurfacing.

Traffic control shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.10 DUST CONTROL. The Contractor shall provide adequate dust control as required by the Airport.

Dust control shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

331416-3.11 CLEANING AND RESTORATION OF SITE. After the trench 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 ordered by the RPR. The Contractor shall restore all disturbed areas to their original condition.

After all Work is completed, the Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

331416-3.12 SCHEDULE OF QUANTITIES. The Engineer has developed a schedule of quantities for the construction items. The list is provided for the Contractor's use but is not warranted to be exhaustive of all of the construction items or complete and accurate. The Contractor is responsible for developing his or her own quantities for this construction work in accordance with the Construction Plans, the conditions in the field, and these Specifications.

Item No.	Description	Quantity
1	6 inch Diameter PVC Water Pipeline with restrained and unrestrained joints	320 LF
2	1-1/4 inch Diameter HDPE Water Lateral	200 LF
3	6 inch Diameter Check Valve with Casing and Lid	1 EA
4	6 inch Diameter Gate Valve with Casing and Lid	3 EA
5	10" x 10" x 6" Tee with Thrust Block	1 EA
6	6" x 6" x 6" Tee with Thrust Block	2 EA
7	6 inch 90 Degree Bend with Thrust Block	2 EA
8	Fire Hydrant Assembly	2 EA
9	1-1/4 inch Water Meter Assembly	1 EA
10	1-1/4 inch Backflow Assembly	1 EA
11	1-1/4 inch Service Tap	1 EA
12	Bollard	4 EA

METHOD OF MEASUREMENT

331416-4.1 Potable Water Pipeline and Appurtenances shall be measured as a lump sum item, in place and complete.

BASIS OF PAYMENT

331416-5.1 The accepted quantity for Potable Water Pipeline and Appurtenances will be paid for at the Contract Lump Sum Price, complete and in place. This price shall be full compensation for furnishing all materials including pipeline, fittings, valves, water meters, backflow devices including enclosure with associated heating, service taps, thrust blocks, tracing wires, valve casings and lids, and all other appurtenances patently required to complete the work, in place and complete, as well as all work to comply with the coordination, scheduling, access, and safety requirements herein specified, and other work as may be required to complete the Item. This item also includes all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 331416-5.1 Potable Water Pipeline and Appurtenances – Lump Sum

END OF ITEM 331416

**ITEM 333113
GRAVITY SEWAGE**

DESCRIPTION

333113-1.1 This Item shall consist of providing and installing gravity sewage, complete and in place at the locations and to the lines and grades shown in the Construction Plans and the Town of Mammoth Lakes Standard Plans and as specified in these specifications and as directed by the Resident Project Representative (RPR).

MATERIALS

333113-2.1 GENERAL Unless otherwise noted, all materials shall meet HS 20 loading requirements and shall conform to the requirements of the Town of Mammoth Lakes Standard Plans and California State Standards as applicable.

333113-2.2 SEWER PIPE. Pipelines and fittings shall be Schedule 40 Polyvinyl Chloride (PVC) pipe, unless noted otherwise.

CONSTRUCTION

333113-3.1 POTHOLE AND LOCATE. The location of the existing utilities crossing the proposed sewer pipelines are not exactly known. Therefore, the Contractor shall perform all exploratory work, including potholing and probing to locate and expose the existing utilities to determine their location, depth, material, and materials, fittings, and work required to make the connection.

Potholing and locating the existing utilities shall not be measured for direct payment. Performance with this Work shall be considered to as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

333113-3.2 TRENCHING. The Contractor shall perform all excavation for the sewer line trench. The excavation shall be of sufficient size to place the sewer line and fittings. Trenching for sewer lines, fittings, and appurtenances shall conform to the details shown in the plans.

Excavation shall not be measured for direct payment. Performance with this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

333113-3.3 INSTALLATION. Installation of pipes and fittings shall be performed in accordance with the Town of Mammoth Lakes Standard Plans, and in accordance with the details in the Construction Plans and the pipe manufacturer's recommendations. Bending of PVC pipe to accomplish horizontal or vertical curves is not permitted.

Installation of pipes, fittings, and appurtenances shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

333113-3.4 BACKFILLING. Backfill material and methods shall conform to the details shown in the plans. Backfill material shall be moisture conditioned, placed, and compacted in accordance with the plans. Minimum compaction requirement is 95 percent relative compaction.

Backfill shall be completed to be flush with the subgrade of the proposed pavement structural section for this area of the project.

Backfill shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

333113-3.5 TRAFFIC CONTROL. The Contractor shall provide, maintain, and remove traffic control as required by the Airport.

Traffic control within the security fence area shall consist of reflective delineators that direct emergency personnel to the trench crossings stabilized with temporary trench resurfacing.

Traffic control shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

333113-3.6 DUST CONTROL. The Contractor shall provide adequate dust control as required by the Airport.

Dust control shall not be measured for direct payment. Performance of this Work shall be considered as a subsidiary obligation of the Contractor covered under the Contract Lump Sum Price for this item.

333113-3.7 CLEANING AND RESTORATION OF SITE. After the trench 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 ordered by the RPR. The Contractor shall restore all disturbed areas to their original condition.

After all Work is completed, the Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

333113-3.8 SCHEDULE OF QUANTITIES. The Engineer has developed a schedule of quantities for the construction items. The list is provided for the Contractor's use but is not warranted to be exhaustive of all of the construction items or complete and accurate. The Contractor is responsible for developing his or her own quantities for this construction work in accordance with the Construction Plans, the conditions in the field, and these Specifications.

Item No.	Description	Quantity
1	3 inch Diameter Sch. 40 PVC Sewer Pipe	25 LF

METHOD OF MEASUREMENT

333113-4.1 Gravity Sewage and Appurtenances shall be measured as a lump sum item, in place and complete.

BASIS OF PAYMENT

333113-5.1 The accepted quantity for Gravity Sewage and Appurtenances will be paid for at the Contract Lump Sum Price, complete and in place. This price shall be full compensation for furnishing all materials including pipeline, fittings, trenching and backfill, and all other appurtenances patently required to complete the work, in place and complete, as well as all work to comply with the coordination, scheduling, access, and safety requirements herein specified, and other work as may be required to complete the Item. This item also includes all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 333113-5.1 Gravity Sewage and Appurtenances – Lump Sum

END OF SECTION 333113

TOWN OF MAMMOTH LAKES
437 OLD MAMMOTH ROAD, SUITE 230
POST OFFICE BOX 1609, MAMMOTH LAKES, CA 93546
(760) 965-3600

PUBLIC WORKS DEPARTMENT

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

APPENDICES

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

May 2026

MAMMOTH YOSEMITE AIRPORT MULTIPURPOSE BUILDING PHASE 2

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- A. PERMITS (Bound Separately) (Industrial Stormwater Permit available at Airport Office)**
- B. PROPOSAL AND CONTRACT (Bid) BOOKLET (Additional Copy Bound Separately)**
- C. CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)**
- D. CONSTRUCTION MANAGEMENT PLAN**
- E. GEOTECHNICAL REPORT**

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Appendix A

PERMITS

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Appendix A

PERMITS (Bound Separately)

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- 1. US Dept. of Agriculture, Forest Service Special Use Permit**
- 2. Industrial Stormwater Permit available at Airport Office**

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Appendix B

**PROPOSAL AND CONTRACT (Bid) BOOKLET
(Additional Copy Bound Separately)**

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Appendix C

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

APPENDIX C

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, MONO COUNTY, CALIFORNIA**

**MULTIPURPOSE BUILDING
PHASE 2**

AIP NO. 3-06-0146-0__-2026

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

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[Date]

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, MONO COUNTY, CALIFORNIA**

**MULTIPURPOSE BUILDING
PHASE 2**

AIP NO. 3-06-0146-0__-2026

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

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EXHIBIT 1 CONSTRUCTION SAFETY AND PHASING PLAN

EXHIBIT 2 CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, MONO COUNTY, CALIFORNIA**

**MULTIPURPOSE BUILDING
PHASE 2**

AIP NO. 3-06-0146-0__-2026

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

INTRODUCTION

The Town of Mammoth Lakes, with Federal assistance from the Federal Aviation Administration under the Airport Improvement Program (AIP), proposes to construct a Multipurpose Building – Phase 2 at Mammoth Yosemite Airport, Mammoth Lakes, California. The Sponsor will comply and will require all parties involved with this project to comply with the Federal Aviation Administration (FAA) requirements regarding safety and phasing of construction projects on airports.

The purpose of this Construction Safety and Phasing Plan (CSPP) is to provide the contractor and project manager guidance for compliance with FAA rules and regulations, and associated requirements of the Town of Mammoth Lakes, with regards to access onto air operations areas of Mammoth Yosemite Airport, Mammoth Lakes, California, during the construction of the subject project.

Prior to issuance of Notice to Proceed, the Contractor will prepare a Safety Plan Compliance Document (SPCD) specifically for this project, furnish the SPCD to the Resident Project Representative (RPR), and obtain RPR's approval of the document.

This Construction Safety and Phasing Plan is based on the guidance of FAA Advisory Circular 150/5370-2G, "Operational Safety on Airports During Construction."

The Checklist for FAA CSPP Review is included in this CSPP. The Contractor will address all items checked on this list in his/her Safety Plan Compliance Document (SPCD) submitted prior to beginning work on this project.

(1) COORDINATION

(a) Progress Meetings

The Sponsor will conduct predesign, prebid, and preconstruction conferences and weekly meetings during construction to introduce and stress the subject of airport operational safety during construction, as follows:

- **Pre-design Conference:** This meeting will be held as soon as sufficient preliminary design work has been completed and prior to preparation of the final plans and specifications. This meeting will be attended by the Design Engineer, Airport Management, Air Transport Association regional representatives, Airline Pilots Association representatives, fixed base operators, airline representatives, FAA airport certification inspector, and the Program Manager of the FAA Airports District Office, as applicable.
 - **Prebid Conference:** This meeting will be held a minimum of 10 days prior to the bid opening date. The participants in this meeting will include prospective bidders, subcontractors, material suppliers, the Design Engineer, and Airport Management.
 - **Preconstruction Conference:** This conference will be conducted as soon as practicable after the contract has been awarded and before issuance of notice to proceed. The participants will include the Design Engineer, Resident Project Representative (RPR), Airport Management, testing laboratory representative, Contractor and subcontractors, Contractor's project superintendent, airport users, utility companies affected by the proposed construction, Federal, State or local agencies affected by the proposed construction, and the Civil Engineer of the FAA Airports District Office, as applicable.
 - **Weekly Meetings:** Weekly progress meetings will be held at the airport. Operational safety will be a standing agenda item for discussion during weekly progress meetings throughout the construction of this project. The Contractor will present an updated progress report for the total work and a two-week look-ahead schedule. The participants will include the RPR, Airport Management, testing laboratory representative, Contractor's project superintendent, subcontractors, airport users, and the Civil Engineer of the FAA Airports District Office, as applicable.
- (b) Scope or Schedule Changes – Changes in the scope or duration of the project may necessitate revisions to the CSPP. These revisions will be submitted for review and approval by the airport operator and the FAA.
- (c) FAA ATO Coordination – No NAVAIDs will be shut down and no changes to final grades in critical areas will be required. No FAA ATO Coordination will be required.

(2) PHASING

There are 115 working days allowed for construction of this project. The scope of work included in this project is as follows:

- Construction work for Multipurpose Building to Include SRE Components including grading, drainage, paving of the access road, and apron, hardscapes, fencing, building and building foundations and floor slabs and building interior and exterior utilities.

- (a) Phasing Elements - The phasing for this project is as shown on the Construction Safety and Phasing Plan, Exhibit 1, and below:

The Contractor's work will be accomplished in one phase corresponding to one work zone as shown on the CSPP, Exhibit 1. Phase 1-1 is the building site, apron, and access road.

Work Phase	Contractor's Work	Facility Closure
1-1	Construct Building Site, Parking Lot, Apron, and ARFF Access Road outside TOFA	Hangar Access Road

Phase 1-1 will require closure of the Hangar Access Road. Access to the East Hangars will be coordinated among Airport Operations, FBO, and Contractor.

The building concrete slab shall not be constructed and left exposed over the winter. The building shell must be completed and closed in over the slab prior to winter and freezing temperatures to protect the concrete slab from freezing.

At the Preconstruction Conference or two weeks prior to the start of work, whichever is greater, the Contractor will provide a detailed two-week lookahead plan and schedule showing limits of proposed work and the locations of barricades. Contractor will give the Airport two weeks' notice prior to start of construction.

- (b) Construction Safety Drawing - The scope of the project and details of the phasing are shown on the Construction Safety and Phasing Plan, Exhibit 1.

(3) AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION

- (a) Identification of Affected Areas. All areas affected by the construction activity in this project are shown on the Construction Safety and Phasing Plan Drawing, Exhibit 1. Identified on this drawing are Aircraft Rescue and Fire Fighting (ARFF) access routes and access routes to be used by airport and airline support vehicles and the Contractor. Also shown are approach/departure surfaces affected by heights of construction equipment and other temporary objects. Construction areas, storage areas, and access routes are also depicted on this drawing.
- (b) Mitigation of Effects. It is necessary to maintain the safety and efficiency of airport operations during construction operations. The establishment of the following procedures will be required:
- (1) Temporary Changes to Runway and/or Taxiway Operations:

The runway and taxiways will remain open at all times during the construction of this project.

There will be no need for the Contractor to cross a runway or taxiway during the construction of this project.

Construction will be limited to no closer than 250 feet from the active runway centerline and 59 feet from the active taxiway centerline. The Runway Safety Area beyond the runway threshold will be maintained at 600 feet.

The work performed under this contract will be completed in one phase corresponding to the Work Zone as shown on Exhibit 1. Contractor will work with the Airport Operations Manager and submit work schedule for approval.

The Airport Owner will provide a qualified flagger to monitor Airport frequency 122.800 MHz and observe aircraft operations at all times when Contractor is working near active taxiways and runway.

Contractor will provide a qualified flagger, trained by the airport, to monitor the airport frequency, 122.800 MHz and observe aircraft operations when the contractor is working near an active runway, taxiway, or restricted area.

Contractor will have on site a vacuum sweeper to keep clean all haul roads on existing airfield pavements as needed. Sweeper will only have nylon bristles, no metal bristles will be allowed to be used on the airport.

(2) Modifications to Aircraft Operation:

There will be no modifications to aircraft operations during this work.

(3) Detours for ARFF and Other Airport Vehicles:

All ARFF and other airport vehicles will have access to all areas on the airport. The route for these vehicles is shown in blue on the CSPP drawing, Exhibit 1.

(4) Maintenance of Essential Utilities and Underground Infrastructure:

Utilities and underground infrastructure that will be affected by this project will be the duct and cable lines, drain lines, sewer and water lines, and telephone line. It will be necessary during this project to protect those utilities on which construction is not being performed. Contractor will verify location and protect existing facilities.

There will be no temporary utilities installed. If one of the existing utility lines is damaged, specifications require the Contractor to immediately repair it at his/her cost and to reimburse the Airport for damages due to shut down. If these damaged utilities cannot be immediately repaired, the Airport will immediately issue required NOTAMs.

(5) Temporary Changes to Air Traffic Control Procedures.

Mammoth Yosemite Airport does not have an Air Traffic Control Tower. Prior to any construction in each stage a NOTAM will be issued identifying areas and times of closure. The RPR, who will be on site during construction, will be equipped with a two-way radio and will monitor Unicom frequency and notify aircraft operating in the area of construction activities or other safety related items.

Contractor will abide by all TSA regulations and restrictions when charter aircraft are operating on the runway and taxiways. Contractor will register all personnel with Airport and designate lead personnel for access badges minimum of 1 week prior to start of work.

(6) NAVAID PROTECTION

There are navigational aids (NAVAIDs) existing on this airport. These NAVAIDs and corresponding critical areas are shown on the Construction Safety and Phasing Plan Drawing, Exhibit 1. Such facilities must be fully protected during the entire construction time.

(a) NAVAIDs Affected by Construction

NAVAIDs on the airport consist of a PAPI and REILs on Runway 27. There is a supplemental wind cone located south of the runway and a wind cone and segmented circle located north of the runway and east of the terminal apron. These NAVAIDs will not be affected by the construction of this project.

There are underground ducts and cable in the construction area to serve the lights, signs and NAVAIDs. The location of these facilities will be identified by USA and the Contractor will be required to protect them.

(b) NAVAIDs Placed out of Service

No NAVAIDs will be placed out of service during the construction of this project.

For emergency notification about impacts to both Airport owned and FAA owned NAVAIDs Airport Management will contact the Operations Control Center at (866) 432-2622.

(c) Protection of NAVAIDs Remaining in Service

Other than when the NAVAIDs are shut down, the Contractor will be limited to no closer than 500 feet from the NAVAID facilities as shown on the CSPP drawing. Work under this contract can be accomplished in the vicinity of these facilities only at approved periods of time. Approval will be subject to withdrawal at any time because of changes in weather, emergency conditions on the existing airfield areas, anticipation of emergency conditions, and for any other reason determined by the RPR acting under the orders and instructions of the airport management. Any instructions to the Contractor to clear any given area, at any time, by the Engineer or Airport Management (by radio or other means) will be immediately executed. Construction work will be commenced in the cleared area only when additional instructions are issued by the proper authorities.

(d) NOTAMs

When NAVAIDs are shut down during construction, experience an unexpected power outage, or are otherwise affected by construction activities, the Airport will issue a Notice to Airmen (NOTAM) as outlined in Article 9 of this CSPP.

(e) Protection of Underground Cable

There are underground ducts and cable in the construction area to serve the lights and NAVAIDs. The location of these facilities will be identified by USA (811) before any work in their general vicinity is started as described in Article 11 of this CSPP. Throughout the entire time of this construction these facilities will be protected by the Contractor from any possible damage, including crossing with unauthorized equipment.

(f) Temporary NAVAIDs

No temporary NAVAIDs are proposed to replace or supplement existing facilities during the construction of this project.

(7) CONTRACTOR ACCESS

(a) Stockpiled Construction Materials

The Contractor will be allowed to temporarily stockpile materials, equipment and supplies in the Contractor's Staging and Storage Area and Temporary Stockpile as shown on the CSPP Drawing. This staging and storage area is located north of the construction site off the airport access road in an area designated by Airport Management. The Contractor will clear and grade area for storage. No separate payment will be made for clearing and grading. The Contractor's Staging and Storage Area perimeter will be marked by approved barricades or fencing.

Contractor will keep haul routes from the Staging and Storage Area to the work sites swept broom clean at all times. Any debris found on aircraft active pavement may require all work to stop and area to be cleaned by the contractor.

All stockpiled materials will be removed prior to completion of the project and any damage to the pavements caused by the Contractor will be repaired at the Contractor's expense.

Stockpiled materials will not be permitted within the Runway Safety Area (RSA) and Object Free Zone (OFZ). If it becomes necessary to stockpile materials in the Runway Object Free Area (ROFA), the Airport will submit a 7460-1 form to the FAA SFO Airports District Office in Walnut Creek, California.

Contractor will install temporary BMPs as required by the SWPPP at the temporary stockpiles located in the Contractor's Staging and Storage Area.

Contractor will be required by the SWPPP to reseed disturbed areas.

Contractor will be responsible for maintaining the security, safety, and cleanliness of the work site and Contractor's Storage and Staging Area and Temporary Stockpile at all times.

Stockpiles will be limited to a height of four (4) feet and will be clearly marked and lighted during hours of restricted visibility or darkness in accordance with Article 16 of this CSPP. The Contractor will determine and verify that stockpiled materials are stabilized and stored at the approved location shown on the CSPP drawing so as not to be a hazard to aircraft operations and to prevent attraction of wildlife (see Article 6) and foreign object debris (see Article 7).

The temporary stockpile location is within the Contractor's Staging and Storage Area and will be coordinated with the Airport Operations Manager.

There are no disposal sites located on airport property. Contractor will be responsible for hauling off site all existing demolished and excavated materials not reused as subbase course or select fill. Contractor will secure a disposal site and obtain all permits.

(b) Vehicle and Pedestrian Operations

It is critical that all pedestrians and vehicles are prevented from unauthorized entry to the Air Operations Area (AOA). The Construction Safety and Phasing Plan, Exhibit 1, clearly delineates the designated access and haul routes, employee parking areas, and construction equipment parking areas. Contractor's personnel and equipment will be limited to the construction areas, parking areas, and haul routes shown on the CSPP Drawing.

Vehicle parking areas will not impact NAVAID signals or penetrate FAR Part 77 imaginary surfaces.

Employee parking and construction vehicle parking will be restricted to the Contractor's Storage and Staging Area as shown on the CSPP drawing. Vehicle and construction traffic will be held off from all active paved areas and in no case allowed to cross the active runway, taxiways, or apron pavement.

Contractor will maintain haul road and paved surfaces clear of debris at all times. Apron and taxiways will be maintained broom clean.

Contractor will construct a 24-foot-wide haul road from the end of Airport Road to the existing access road east of the water storage tank and pump house. Contractor will maintain this haul road for all construction equipment and material deliveries for the duration of the project. Haul routes are indicated in red on the CSPP drawing, Exhibit 1. This Contractor's haul road accesses the airport through a 4-strand barb wire fence. Contractor will install a temporary gate at this entrance to the airport property.

Contractor will work with the RPR and the Airport Operations Manager to maintain access to the water storage tank and pump house.

Contractor will maintain haul road and paved surfaces clear of debris at all times.

There will be no construction equipment or personnel in the active AOA.

Contractor's vehicles and equipment will include a flag on a staff attached to the vehicle so that the flag will be readily visible. The flag will be at least a 3-foot by 3-foot square having a checkered pattern of international orange and white squares at least 1 foot on each side. During periods of low visibility conditions, dawn, or dusk, Contractor vehicles and equipment will be equipped with an amber flashing beacon mounted on the uppermost part of the vehicle structure.

All vehicle/equipment operators driving on the airport must have an appropriate level of knowledge of airport rules and regulations. The Contractor will be required to submit a list of authorized vehicle operators to the Airport. The vehicle operators will be required to maintain a current drivers' license. Driver training will be limited to designating areas to be avoided and areas where free access will be available. No vehicle will be allowed to cross an active pavement without an escort.

Contractor will be required to abide by all Airport regulations and restrictions. Contractor will register all personnel with the Airport and designate lead personnel for access badges a minimum of one week prior to start of work.

(c) Two-Way Radio Communications

Two-way radio communications are required on Unicom frequency 122.800 MHz. Continuous monitoring is required. The driver, through personal observation, will confirm that no aircraft is approaching the vehicle position. Construction personnel may operate in a movement area without two-way radio communication provided

a NOTAM is issued closing the area and that the area is properly marked to prevent incursions and the Airport's flagger is present to control operations. The Airport's flagger will either be an airport specialist or the project engineer's specialist. These flaggers will be trained on all movement area procedures.

Contractor will provide a qualified flagger, trained by the Airport, to monitor Airport Frequency 122.80 MHz and observe aircraft operations when contractor is working near active runways, taxiways, and restricted areas. Contractor will work with Airport Operations and Resident Project Representative to coordinate the monitoring of the Airport Frequency when working near the active runway and taxiways.

(d) Airport Security

There is a security fence and gates around a portion of the property of this airport. All gates used by the Contractor will remain closed at all times except when authorized equipment is actually entering the airport. During continuous use of a gate for delivery of equipment or materials, Contractor will request that the Airport place the gate in a locked open state. Contractor will provide a flagger, trained for the airport and place the flagger at the open gate to keep unauthorized personnel and wildlife from entering the airport. The fence, designated Contractor gate, and secure areas on the airport are shown on the CSPP Drawing, Exhibit 1. Contractor will post a sign reading "Contractor's Work Entrance Only." Contractor will be responsible for security of the entrance during Contractor's working hours.

Contractor will maintain access to the airport through one of the gates at all times. Contractor will install "Airport Access" signage to direct traffic to the gate in use.

All Contractor personnel working on the airport will wear in a prominent location airport-furnished badges or hard hats with Contractor's logo to show that they are authorized on the airport. Contractor will register all personnel with Airport Operations and designate lead personnel for access badges prior to the start of work.

Contractor's personnel and equipment will remain outside of designated Security Identification Display Area (SIDA), located on the terminal apron. All construction work inside the SIDA will be approved by the RPR and Airport Operations Manager. Contractor's personnel and equipment will only enter the SIDA area with approved badges or airport escort when scheduled work has been approved.

In accordance with the requirements of the Federal Aviation Administration as set forth in FAR 107.11(F), the Contractor will take all steps necessary to assure Owner that the backgrounds of all employees have been checked to the extent necessary to assure that permitting them unescorted access to any area on the airport controlled for security reasons is appropriate. This background check, to the extent allowable by law, will include at a minimum references and prior employment histories to the extent necessary to verify representations made by the employee relating to employment in the preceding 5 years.

(8) WILDLIFE MANAGEMENT

The airport is partially fenced with a 4-foot barbwire fence. All gates will remain closed at all times except when vehicles are entering or exiting them or they are guarded by a flagger as stated in Article 5 of this CSPP.

A Wildlife Hazard Management Plan is in place for the Mammoth Yosemite Airport. There are reports of mule deer in the area. Care will be taken to prevent inadvertent incidents of wildlife hazards.

The Contractor will carefully control and continuously remove waste or loose materials that might attract wildlife and be aware of and avoid construction activities that might attract wildlife such as:

- Trash – Food scraps will be collected from construction personnel activity.
- Standing water
- Disruption of existing wildlife habitat.
- Open trenches, excavation, and stockpile materials.
- Poorly maintained fencing and gates.

Should the Contractor encounter wildlife on the airport, he/she will immediately notify Airport Management.

All trash will be placed in waste containers to prevent the attraction of wildlife. Waste containers will be equipped with lids and secured at all times. The Contractor will leave no trash or debris on site.

(9) FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

The Contractor will not be allowed to leave or place foreign object debris (FOD) on or near active aircraft movement areas – runway, taxiways, aprons - and will be required to control and monitor FOD. Materials tracked onto these areas will be continuously removed during the construction project by broom sweeping. Ground vehicle tires will be inspected daily to ensure they are not tracking FOD onto the airfield pavements. Daily inspections of these aircraft movement areas will be made by the RPR as discussed in Article 10 of this CSPP.

(10) HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT

The Contractor will be required to manage and contain any hazardous materials (HAZMAT) on the airport. Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean up spills resulting from fuel or hydraulic fluid leaks. The Contractor will refrain from topping off vehicle fuel tanks and have sorbent materials available in the fueling area for when small spills occur. The fueling operation must follow State of California regulations and the regulations of the Airport's Industrial Permit SWPPP.

It is not anticipated that there will be any hazardous materials used or encountered during the construction of this project. The Contractor will be required to keep Material Safety Data Sheets (MSDS) available for inspection for all materials delivered to the airport.

(11) NOTIFICATION OF CONSTRUCTION ACTIVITIES

- (a) List of Responsible Representatives. It will be necessary to keep the following people totally informed of the operations that the contractor proposes to perform at Mammoth Yosemite Airport.

Sponsor:

Soibian Spring, Airport Manager.....(760) 914-0065

FBO:

Hot Creek Aviation.....(760) 924-9127

F.A.A.

Ron Biaoco, Civil Engineer(925) 546-6444
Ron.Biaoco@faa.gov

Resident Project Representative

Melissa Brandley, Project Manager (916) 652-4725 Office
.....(916) 316-1415 Cell
Tom Steinkamp, RPR (916) 652-4725 Office
.....(916) 622-5478 Cell

At the start of construction the Contractor will be required to provide the RPR with the names, telephone numbers, cell phone numbers, and e-mail addresses of all Contractor personnel that are responsible for on-call 24/7 services if necessary.

- (b) NOTAMs

The Airport Management will issue Notices to Airmen (NOTAMs) as required accurately describing current airport conditions and contractor operations. This will be coordinated with tenants of the airport. Sierra Shultz, Assistant Engineer, and Soibian Spring, Airport Operations and Maintenance, will be responsible for issuing, maintaining, and canceling NOTAMs. The Airport Management has provided a list of airport employees who are authorized to issue NOTAMs to the FSS air traffic manager.

NOTAMs will be issued clearly identifying where the construction work is being performed and during which periods, including all facility closures indicated in the staging plan table in Article (2)(a).

- (c) Emergency Notifications:

In case of emergency during the construction of this project, Contractor will notify one or more of the following:

Fire/Police/Ambulance Call 911
Airport Radio Communication (Article 5 of CSPP) 122.800 Mhz
Aircraft Rescue and Fire Fighting (ARFF) - Emergency Call 911
Mammoth Lakes Police Department (Non Emergency).....(760) 934-2011
Mammoth Hospital (Non Emergency).....(760) 934-3311
Mammoth Lakes Fire Protection District (Non Emergency)...(760) 934-2300
Poison Control(800) 222-1222

(d) Coordination with Fire Department Personnel:

The Contractor will be required to notify Airport and/or ARFF personnel if any water lines or fire hydrants are damaged or deactivated. The Contractor will also notify Airport and/or ARFF personnel if there are any blocked or rerouted emergency access routes or if hazardous materials will be used on the airfield. The non-emergency telephone number for Mammoth Lakes Fire Protection District is (760) 934-2300 and the contact person is Dispatcher on Duty. Contractor will confirm in writing the date and time ARFF was notified and the contact person.

(e) Notification to the FAA:

Part 77. The Contractor will coordinate with the RPR who will file a 7460-1 form with the F.A.A. Airports District Office in Walnut Creek if any construction equipment (i.e. cranes, graders, other equipment) affects navigable airspace as defined in FAR Part 77.

(12) INSPECTION REQUIREMENTS

The Airport will provide a Resident Project Representative (RPR) to ensure that all Contractor operations comply with all requirements of the plans, specifications, and this Safety Plan. It will be his/her duty to inspect materials and workmanship of the work under instructions of the Airport or Engineer and to report any and all deviations from the Drawings, Specifications, and other Contract provisions that may come to his/her notice. The RPR will have the right to order the work entrusted to his/her supervision immediately stopped, if in his/her opinion such action becomes necessary, until the Owner or Engineer is notified and has determined and ordered that the work may proceed in due fulfillment of all Contract requirements.

- (a) Daily Inspections. Daily inspections will be conducted to ensure conformance with the CSPP. Exhibit 2 of this CSPP includes a Construction Project Daily Safety Inspection Checklist for this purpose.
- (b) Final Inspections. Whenever an area on the airport is reopened for aircraft operations, an inspection will be conducted to assure compliance with the plans, specifications, and CSPP. At the end of the project a final inspection will be held by the RPR, the Airport Management, and the Federal Aviation Administration to

assure all components of the project comply with the plans, specifications, and CSPP.

(13) UNDERGROUND UTILITIES

Not less than two full working days prior to performing any excavation, the Contractor will - be required to notify Underground Service Alert (USA) by calling 811. The location of the subsurface installations will be in accordance with Sections 4216 and 4217 of the Government Code, as latest amended. No excavation will be performed until the subsurface installations have been located, hand-excavated and identified. The Contractor will update the location of the subsurface installations in the proposed work area every 14 calendar days, as required.

In case of accidental utility disruption, utilities owners' contacts and telephone numbers are included below:

Water – Mammoth Community Water District	(760) 934-2596
Electrical – Southern California Edison	(800) 655-4555
Gas – Amerigas	(760) 934-2213
Telephone – Verizon Telephone Service	(800) 483-3000

Refer to Article 9 of this CSPP for procedures for contacting the Fire Protection District and FAA in case of interruption of water service and NAVAIDs, respectively.

(14) PENALTIES

If in the opinion of Airport Management or the RPR, the Contractor's employees or subcontractors are in violation of the airport's rules and regulations, including this CSPP, in sufficient magnitude as to cause danger to life and property, the RPR will have the right to stop all work on this contract for a period of forty-eight (48) hours as a contractual penalty.

Any vehicle operator who willfully violates the CSPP will be requested, through the Contractor, to leave the job site.

(15) SPECIAL CONDITIONS

Some special conditions may trigger specific safety mitigation actions outlined in this CSPP. These may include low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle/Pedestrian Deviations (VPD), and other activities requiring construction suspension/resumption. In order to be advised of these special conditions and actions to be taken, the Contractor will at all times maintain radio contact as specified in Article 5 of this CSPP.

Should an aircraft emergency occur anyplace on the airport, the Contractor will be required to move all personnel and equipment beyond the safety area of the runway and taxiways and to refrain from moving out of these areas to resume work until specifically authorized by Airport personnel. The area around the downed aircraft will be evacuated and not reentered by the Contractor until given permission, except for lifesaving activities.

Contractor will be responsible for dust and erosion control during the construction of this project. Contractor will be required to acquire water permits as required by the Town of Mammoth Lakes or Mono County prior to start of any work on the airport.

Contractor will be required to protect all property corner markers and bench marks from damage.

(16) RUNWAY AND TAXIWAY VISUAL AIDS

There exist on the airport runway and taxiway marking and runway and taxiway lights and signs. These facilities are shown on the attached Construction Safety and Phasing Plan Drawing, Exhibit 1. Areas where aircraft will be operating will be clearly and visibly separated from construction areas. Throughout the duration of the construction project, these areas will remain clearly marked and visible at all times and all marking, lighting, and signs will remain in place and operational.

It will not be necessary to install temporary marking, lights, or signs during the construction of this project.

For a visaid service outage greater than 24 hours or for less time, but over consecutive days, a scheduled facility service outage NLT will be requested 30 days in advance using FAA Form 6000-26, "Airport Sponsor Strategic Even Submissions Form and emailed to 9-AJV-SEC-WSA@faa.gov.

(17) MARKING AND SIGNS FOR ACCESS ROUTES

If required, marking and signing for access routes to the construction site will be provided by the Contractor. Signs will conform to Advisory Circular 150/5340-18F, Standards for Airport Sign Systems. To the extent possible, signs will be in conformance with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications and will not be hand lettered.

(18) HAZARD MARKING AND LIGHTING

The airport will be kept open during construction of work on this project. The Contractor will furnish, erect and maintain hazard marking and lighting at the boundary of the work area to keep aircraft from entering the Contractor's work areas and to keep the Contractor's personnel and equipment from occupying any of the areas open for aircraft operations. Hazard marking and lighting will also be placed to identify all areas under repair, stockpiled material, waste areas, and areas subject to jet blast. The locations and details of barricades to be placed in this project are shown on the Construction Safety and Phasing Plan, Exhibit 1.

Contractor will install Airport furnished lighted barricades at the beginning of the project and maintain barricades during construction of the project. Contractor-furnished barricades will be installed at locations shown on the CSPP, Exhibit 1.

Barricades will be Type II lighted barricades. Maximum spacing between barricades will be four (4) feet. Each barricade will have two solar-powered lights with amber or red lenses each controlled by photocells such that they are on at night and off during the day. Barricades will be painted alternate orange and white diagonal striping. Barricades will be securely fastened or weighted so they will not be disturbed by high winds or jet blast. These barricades will be supplemented with signs such as “No Entry,” “No Vehicles,” as necessary.

Contractor will furnish and place Type II barricades at the beginning of the project and maintain barricades during all work phases. Details of the Type II barricades are shown on Exhibit 1. These barricades will be installed at the locations shown on the CSPP, Exhibit 1.

Barricades are not permitted in any active safety area or on the runway side of a runway hold line.

The Contractor will supply the names and telephone numbers of persons responsible for the emergency maintenance of the hazard marking and lighting during construction of this project who will be available 24 hours a day.

(19) PROTECTION OF RUNWAY AND TAXIWAY SAFETY AREAS

No construction will occur within a Runway Safety Area (RSA) or Taxiway Object Free Area (TOFA) while the runway or taxiway is open for aircraft operations. These safety areas, along with the Runway Obstacle Free Zone (OFZ), Runway Object Free Area (ROFA), Taxiway Object Free Area (TOFA), and runway approach and departure surfaces, are shown on the Construction Safety and Phasing Plan, Exhibit 1.

No blasting operations will be required or allowed during the construction of this project.

The Contractor will furnish, erect, and maintain red or orange flags, as approved by the airport operator, and red lights during hours of restricted visibility or darkness, around open trenches, excavations, temporary stockpiles, and his/her parked construction equipment that may be hazardous to the operation of aircraft, emergency fire-rescue, or maintenance vehicles on the airport. See Article 16 of this CSAA for details of Hazard Marking and Lighting.

No drop-off greater than 3 inches will be allowed to exist within the RSA (250 feet of the centerline of Runway 9-27) or TSA (59 feet of the centerline of taxiways) for runways and taxiways that are open for aircraft operations at night, weekends, or during periods when the Contractor is not working in these areas. If excavation occurs within the RSA or TSA that leaves a depression greater than 3 inches, the Contractor will fill the excavated area such as to maintain a maximum 3 inch drop off at the edge of pavement and extend at a maximum slope of 5 percent from the edge of pavement. This embankment will be rolled a sufficient amount such that it will withstand truck traffic without rutting. The backfill will be removed from this area or spread out and used as the specified segment of the pavement section when work resumes in the area.

The RSA and TSA on active runways and taxiways will be:

- a. Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations.
- b. Drained by grading or storm sewers to prevent water accumulation.
- c. Capable under dry conditions of supporting construction and maintenance equipment, aircraft rescue, fire-fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.
- d. Free of objects, except for objects that need to be located in the RSA because of their functions. These objects will be constructed on low impact resistant supports (frangible mounted structures) to the lowest practical height with the frangible point no higher than 3 inches above finished grade.

During all times that Contractor's personnel and equipment are not working on the project, they will be located to a point greater than 250 feet from the centerline of Runway 9-27. All equipment will be stored in the Contractor's Storage and Staging Area at night and during the weekends.

Construction may be permitted in the runway OFA. However, equipment must be removed from the runway OFA when not in use, and material will not be stockpiled in the runway OFA. (Stockpiling material in the OFA requires submittal of a 7460-1 and justification provided to the FAA Airports District Office for approval.)

No construction may occur within a taxiway OFA while the taxiway is open for aircraft operations.

No construction equipment or personnel may penetrate the OFZ while the runway is open for aircraft operations.

All personnel, materials, and/or equipment must remain clear of the applicable runway approach/departure areas and clearways as shown on the Construction Safety and Phasing Plan, Exhibit 1.

During construction an experienced flagger furnished by the Airport will have a two-way radio tuned to Unicom frequency 122.800 MHz. He/she will also by visual observation identify any aircraft operation at the airport as detailed in Article 5 of this CSPP. NOTAMs will be issued to alert pilots of this condition. During all times when Contractor's equipment and personnel are not working on the project, equipment shall be moved back to a point 250 feet from the centerline of Runway 9-27. At night and weekends all Contractor's equipment will be moved to the Contractor's Staging and Storage and Temporary Stockpile Area as shown on the Construction Safety and Phasing Plan.

If it is necessary to use construction equipment (cranes, concrete pumps, etc.) that is higher than 25 feet, a 7460-1 determination will be issued for such equipment as outlined in Article 18 of this CSPP.

(20) OTHER LIMITATIONS ON CONSTRUCTION

Additional limitations on construction include, but are not limited to:

- a. No use of equipment taller than 25 feet (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for each piece of equipment. Contractor must allow for up to 50 working days after the request to use equipment taller than 25 feet to allow for FAA to make a determination on a 7460-1.
- b. No use of open flame welding or torches unless fire safety precautions are provided, and the airport operator has approved their use.
- c. No use of electrical blasting caps on or within 1,000 feet of the airport property.
- d. No use of flare pots within the air operations area.

APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

Table D-1. Potentially Hazardous Conditions

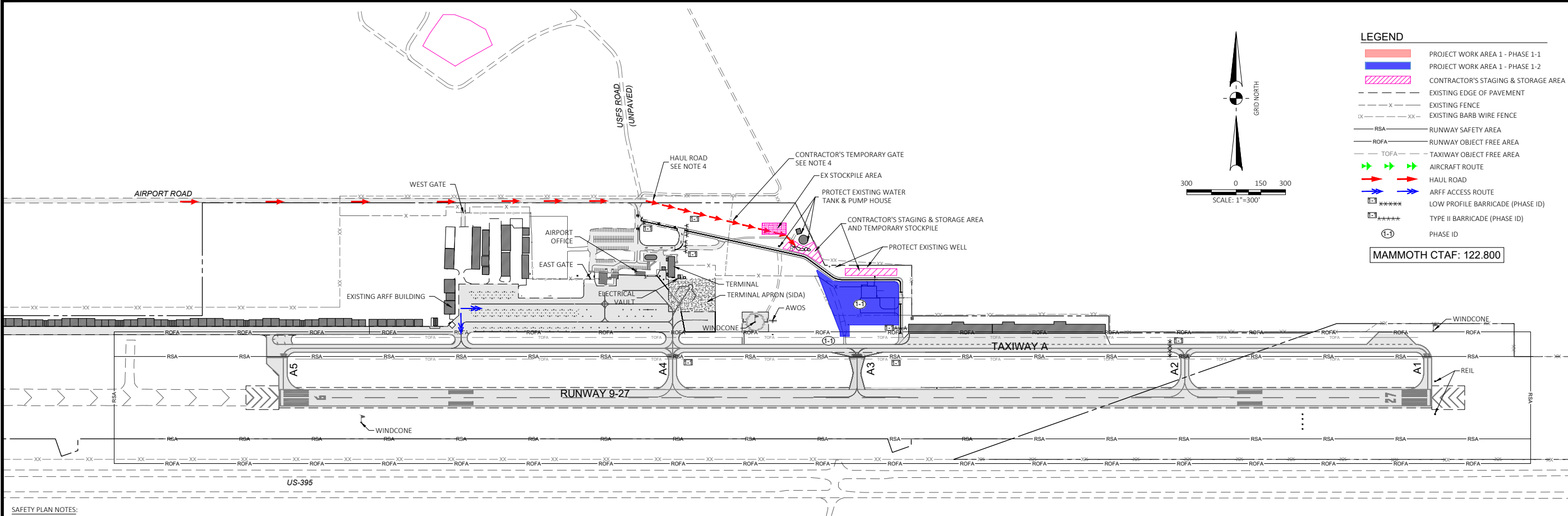
Item	Action Required (Describe)	No Action Required (Check)
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.		
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.		
Runway resurfacing projects resulting in lips exceeding 3 inch (7.6 cm) from pavement edges and ends.		
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.		
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.		
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and		

Item	Action Required (Describe)	No Action Required (Check)
approach zones.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.		
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.		
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.		
Obliterated or faded temporary markings on active operational areas.		
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.		

Item	Action Required (Describe)	No Action Required (Check)
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.		
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.		
Lack of radio communications with construction vehicles in airport movement areas.		
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.		
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		

Item	Action Required (Describe)	No Action Required (Check)
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		
Site burning, which can cause possible obscuration.		
Construction work taking place outside of designated work areas and out of phase.		

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SAFETY PLAN NOTES:

- CONSTRUCTION OF THIS PROJECT SHALL BE IN ACCORDANCE WITH THE CONTRACT AGREEMENT, THESE PLANS, TECHNICAL SPECIFICATIONS, SPECIAL PROVISIONS, INFORMATION FOR BIDDERS, AND ALL APPLICABLE FAA STANDARDS, MUNICIPAL STANDARDS, AND OTHER REFERENCED DOCUMENTS. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL SAFETY AND ENVIRONMENTAL REGULATIONS. THE PROJECT IS SUBJECT TO INSPECTION OF THE OWNER AND THE RESIDENT PROJECT REPRESENTATIVE DESIGNATED BY THE OWNER, THE FEDERAL AVIATION ADMINISTRATION, AND ANY OTHER GOVERNING AGENCIES.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY STATE AND LOCAL PERMITS PRIOR TO CONSTRUCTION OF THIS PROJECT.
- THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING A MINIMUM OF 2 WEEKS IN ADVANCE TO OBTAIN CLEARANCE FOR WORK.
- CONTRACTOR SHALL GIVE NOTICE TO THE OWNER AND RPR 10 WEEKS BEFORE ANTICIPATED USE OF ANY CRANE, BOOM, CONCRETE PUMP, OR SIMILAR EQUIPMENT OVER 25' IN HEIGHT FOR THE REQUIRED FILING OF AN FAA OBSTRUCTION EVALUATION / AIRPORT AIRSPACE ANALYSIS.
- THE CONTRACTOR'S SUPERINTENDENT SHALL BE ON THE CONSTRUCTION SITE AT ALL TIMES DURING WORKING HOURS WHILE THIS PROJECT IS IN PROGRESS. SUPERINTENDENT SHALL BE CONTRACTOR'S DESIGNATED RESPONSIBLE REPRESENTATIVE AND SHALL BE AVAILABLE IN CASE OF EMERGENCIES ON A 24-HOUR DAILY BASIS.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CLEANLINESS, SAFETY, AND SECURITY OF THE WORK, STAGING AND STORAGE AREAS AT ALL TIMES.
- CONTRACTOR SHALL ABIDE BY ALL AIRPORT REGULATIONS AND RESTRICTIONS. CONTRACTOR WILL REGISTER ALL PERSONNEL WITH AIRPORT AND DESIGNATE LEAD PERSONNEL FOR ACCESS BADGES MINIMUM OF 1 WEEK PRIOR TO START OF WORK.
- CONTRACTOR WILL PROVIDE A QUALIFIED FLAGGER WITH RADIO TO MONITOR AIRPORT FREQUENCY, 122.80 MHZ AND OBSERVE AIRCRAFT OPERATIONS WHEN CONTRACTOR IS WORKING NEAR ACTIVE RUNWAYS, TAXIWAYS AND RESTRICTED AREAS.
- CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN LIGHTED BARRICADES DURING CLOSING OF THE ACCESS ROAD. CONTRACTOR PROVIDED BARRICADES SHALL BE FURNISHED AND INSTALLED AS SHOWN ON THE PLANS. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN 2 WEEKS BEFORE WORK COMMENCES.
- CONTRACTOR SHALL COORDINATE WITH RPR AND OPERATIONS MANAGER TO MAINTAIN ACCESS TO THE WATER STORAGE TANK AND PUMP HOUSE.
- CONTRACTOR SHALL CONSTRUCT A 24' HAUL ROAD FROM THE END OF AIRPORT ROAD TO THE CONTRACTOR'S STAGING AREA WEST OF THE WATER STORAGE TANK AND PUMP HOUSE. CONTRACTOR SHALL MAINTAIN THIS HAUL ROAD FOR ALL CONSTRUCTION EQUIPMENT AND MATERIAL DELIVERIES FOR DURATION OF THE PROJECT. CONTRACTOR AND AIRPORT SHALL COORDINATE THE LOCATION OF THE HAUL ROAD. THIS CONTRACTOR'S HAUL ROAD ACCESSES THE AIRPORT THROUGH A 4 STRAND BARB WIRE FENCE. CONTRACTOR SHALL INSTALL A TEMPORARY GATE AT THIS ENTRANCE TO AIRPORT PROPERTY.
- CONTRACTOR SHALL NOT TRAVEL ON OR ACROSS ANY RUNWAY OR TAXIWAY PAVEMENT. CONTRACTOR SHALL ACCESS WORK AREA BY WAY OF THE DESIGNATED HAUL ROAD FROM AIRPORT ROAD.
- CONTRACTOR'S STORAGE AREA SHALL BE DESIGNATED IN THE AREA SHOWN ON THE PLANS AND THE PERIMETER MARKED BY APPROVED BARRICADES OR FENCING. NO SEPARATE PAYMENT FOR CLEARING & GRADING.
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES, SERVICE LATERALS, AND CONDUIT ("UTILITIES") IS BASED ON THE BEST AVAILABLE INFORMATION TO THE ENGINEER AND SHALL BE ASSUMED AS APPROXIMATE AND REQUIRING FIELD VERIFICATION. CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING AND AVOIDING ALL UTILITIES AND FOR REPAIRING ALL DAMAGE THAT OCCURS DUE TO THE CONTRACTOR'S ACTIVITIES.

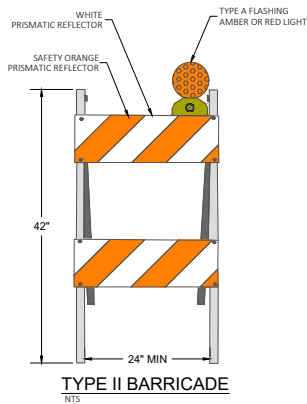
CALL BEFORE YOU DIG. CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT PRIOR TO CONSTRUCTION AT 811 OR USANORTH811.COM. CONTRACTOR SHALL POTHOLE TO VERIFY LOCATION, DEPTH, AND SIZE OF UTILITIES WITHIN THE LIMITS OF CONSTRUCTION. NO EXTRA PAYMENT FOR POTHOLES.

- CONTRACTOR SHALL VERIFY LOCATION AND PROTECT ALL EXISTING UTILITIES. SHOULD CONTRACTOR ENCOUNTER AND DAMAGE A WATERLINE ON THE AIRPORT, THEY SHALL IMMEDIATELY NOTIFY THE LOCAL FIRE DEPARTMENT AND THE AIRPORT.
- CONTRACTOR SHALL PROTECT ALL PROPERTY CORNER MARKERS AND BENCH MARKS FROM DAMAGE.
- IN CASE OF AN AIRCRAFT EMERGENCY THE AREA AROUND THE AIRCRAFT SHALL BE EVACUATED AND NOT REENTERED BY THE CONTRACTOR WITHOUT GIVEN PERMISSION EXCEPT FOR LIFESAVING ACTIVITIES.
- ALL GATES USED BY THE CONTRACTOR SHALL REMAIN CLOSED AT ALL TIMES EXCEPT WHEN AUTHORIZED EQUIPMENT IS ACTUALLY ENTERING THE AIRPORT. DURING CONTINUOUS USE OF A GATE FOR DELIVERY OF EQUIPMENT OR MATERIALS, CONTRACTOR SHALL REQUEST THAT THE AIRPORT PLACE THE GATE IN A LOCKED OPEN STATE; CONTRACTOR SHALL PROVIDE A FLAGGER, TRAINED BY THE AIRPORT AND PLACE THE FLAGGER AT THE OPEN GATE TO KEEP UNAUTHORIZED PERSONNEL AND WILDLIFE FROM ENTERING THE AIRPORT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DUST AND EROSION CONTROL DURING THE DURATION OF THE PROJECT. CONTRACTOR SHALL ACQUIRE WATER PERMITS AS REQUIRED BY THE TOWN OF MAMMOTH LAKES OR MONO COUNTY PRIOR TO START OF ANY WORK ON THE AIRPORT.
- ALL EQUIPMENT OPERATING DURING DAYLIGHT HOURS SHALL BE EQUIPPED WITH AN ORANGE AND WHITE CHECKERED FLAG OR FLASHING AMBER BEACON. EQUIPMENT OPERATING IN LOW VISIBILITY CONDITIONS, DAWN OR DUSK HOURS SHALL BE EQUIPPED AND USE AN AMBER FLASHING BEACON.
- ALL TRASH SHALL BE PLACED IN WASTE CONTAINERS TO PREVENT THE ATTRACTION OF WILDLIFE. WASTE CONTAINERS SHALL BE EQUIPPED WITH LIDS AND SECURED AT ALL TIMES. NO TRASH OR DEBRIS SHALL BE LEFT ON SITE BY THE CONTRACTOR.
- NO DISPOSAL SITES LOCATED ON AIRPORT PROPERTY. CONTRACTOR SHALL BE RESPONSIBLE FOR HAULING OFF SITE ALL EXISTING DEMOLISHED AND EXCAVATED MATERIALS NOT REUSED AS AGGREGATE SUBBASE OR SELECT FILL. CONTRACTOR SHALL SECURE A DISPOSAL SITE AND OBTAIN ALL PERMITS. NO SEPARATE PAYMENT FOR DISPOSAL SITE, DISPOSAL PERMIT OR HAULING OFFSITE.
- CONTRACTOR SHALL INSTALL THE TEMPORARY BMP'S AS REQUIRED BY THE SWPPP AT THE TEMPORARY STOCKPILES LOCATED IN THE CONTRACTOR'S STORAGE AND STAGING AREA.
- AT THE CONCLUSION OF ALL WORK, CONTRACTOR SHALL SEED CONTRACTOR'S STORAGE, STAGING AND TEMPORARY STOCKPILE AREA AND ALL DISTURBED GRADING OR EMBANKMENT AREAS. LIMITS OF SEEDING SHALL BE VERIFIED BY RESIDENT ENGINEER. HYDROSEEDING SHALL BE A REQUIRED BMP. NO ADDITIONAL PAYMENT FOR SURFACE PREPARATION OR SEEDING OF DISTURBED AREAS SHALL BE MADE. SEED MIX MUST MATCH LOCAL GRASSES, COMPLY WITH LOCAL REQUIREMENTS, AND BE SUITABLE FOR USE ON AIRPORTS. SEED MIX, MULCH, FERTILIZER, AND APPLICATION RATES SHALL BE APPROVED BY OWNER PRIOR TO USE. HYDROSEEDING MUST PRODUCE ADEQUATE GROWTH TO SATISFY THE STATE WATER BOARD SUCH THAT THE SWPPP, IF REQUIRED, CAN BE CLOSED OUT AFTER THE PROJECT IS COMPLETE.

CONSTRUCTION RESPONSIBILITY & CONSTRUCTION SCHEDULES:

- WORK IN ZONE 1-1 WILL REQUIRE CLOSURE OF THE HANGAR ACCESS ROAD. ACCESS TO THE EAST HANGARS WILL BE COORDINATED WITH AIRPORT OPERATIONS, FBO AND CONTRACTOR .
- TAXIWAY CLOSURES ARE NOT ANTICIPATED FOR THIS PROJECT. SHOULD A CLOSURE BE DEEMED NECESSARY BY THE CONTRACTOR AND RPR, CLOSURE WILL BE PERMITTED DURING WORKING DAYS AND WORKING HOURS ONLY.
- THE BUILDING CONCRETE FLOOR SLAB SHALL NOT BE CONSTRUCTED AND LEFT EXPOSED OVER WINTER. THE BUILDING SHELL MUST BE COMPLETED AND CLOSED IN OVER THE SLAB PRIOR TO WINTER AND FREEZING TEMPERATURES TO PROTECT THE CONCRETE SLAB.

SITE WORK PHASE & WORK ZONES					
WORK ZONE	WORK PHASE	CONTRACTOR'S WORK	CONTRACTOR'S WORK AREA	FACILITY CLOSURE	CLOSED FACILITY DAYS
1	1-1	BUILDING SITE, PARKING AREA, APRON AND ARFF ACCESS ROAD	BUILDING SITE, APRON AND ARFF ACCESS	HANGAR ACCESS ROAD	



TYPE II BARRICADE NOTES:

- CONTRACTOR SHALL FURNISH, PLACE AND MAINTAIN TYPE II BARRICADES AT THE BEGINNING OF PROJECT, AND MAINTAIN BARRICADES DURING SITE WORK PHASES.
- EACH TYPE II BARRICADE SHALL HAVE ONE 1 - SOLAR POWERED LIGHT WITH RED LENS, EACH CONTROLLED BY PHOTOCELLS SUCH THAT THEY ARE ON CONTINUOUS AT NIGHT AND OFF BY DAY.
- BARRICADES SHALL BE SECURED IF NECESSARY TO RESIST MOVEMENT FROM GUSTY WINDS AND JET OR PROP BLAST. TYPE II BARRICADES SHALL BE WEIGHTED DOWN WITH SAND BAGS AS NEEDED. TYPE II BARRICADE MAY BE USED ON ROADS OUTSIDE OF AIRPORT PERIMETER FENCE.
- LOCATE BARRICADES AS SHOWN ON THE PLAN AND DIRECTED BY RESIDENT PROJECT REPRESENTATIVE. SPACING BETWEEN BARRICADES SHALL NOT EXCEED 4 FEET. SEE THIS SHEET FOR BARRICADE LOCATIONS.
- AT THE COMPLETION OF THE CONSTRUCTION, SITE CONTRACTOR SHALL REMOVE ALL TYPE II BARRICADES FROM THE AIRPORT.

6125 KING ROAD, SUITE 201 - LOOMIS, CALIFORNIA 95650 - (916) 652-4725

BRANDLEY

ENGINEERING

ENGINEER OF RECORD

PROFESSIONAL ENGINEER
No. C71139
Exp. 5-30-2027

RECEIVED
CIVIL
CALIFORNIA

REVISIONS	BY	DATE
No.		

MAMMOTH YOSEMITE AIRPORT
CALIFORNIA
MAMMOTH LAKES

SNOW REMOVAL EQUIPMENT BUILDING

CONSTRUCTION SAFETY AND PHASING PLAN

DATE	3/26/2026
DRAWN	KDC
CHECKED	MSB
PROJECT No.	75.22
FILE	7522-2.G01-02.CBPP
SCALE	1"=300'
SHEET No.	Exhibit 1

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Appendix D

CONSTRUCTION MANAGEMENT PLAN

APPENDIX D

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, MONO COUNTY, CALIFORNIA**

**MULTIPURPOSE BUILDING
PHASE 2**

AIP NO. 3-06-0146-0__-2026

CONSTRUCTION MANAGEMENT PLAN

Prepared by:

**Brandley Engineering
6125 King Road, Suite 201
Loomis, CA 95650
Telephone (916) 652-4725
Fax (916) 652-9029**

May 2026

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, MONO COUNTY, CALIFORNIA**

**MULTIPURPOSE BUILDING
PHASE 2**

AIP NO. 3-06-0146-0__-2026

CONSTRUCTION MANAGEMENT PLAN

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I. INTRODUCTION

I. INTRODUCTION

The Town of Mammoth Lakes proposes the construction of the following facilities at the Mammoth Yosemite Airport, Mammoth Lakes, Mono County, California:

- Construction work for Multipurpose Building to Include SRE Components including grading, drainage, paving of the access road, and apron, hardscapes, fencing, building and building foundations and floor slabs and building interior and exterior utilities.

The Sponsor is committed to providing and maintaining competent technical supervision at the construction site throughout the project to assure conformance with the approved plans and specifications. A Construction Management Plan has been prepared to detail the measures and procedures that are required to assure compliance with the Quality Control (QC) provisions of the construction contract. The Contractor is responsible for all Quality Control (QC) testing and inspection. The Sponsor is responsible for Quality Assurance (QA) to confirm that all work has been performed in accordance with the plans and specifications. This report details the Construction Management Plan for this project.

II. CONSTRUCTION MANAGEMENT PERSONNEL

II. CONSTRUCTION MANAGEMENT PERSONNEL

Quality Assurance (QA) Program – Sponsor Responsible

Sponsor: Town of Mammoth Lakes, Mammoth Yosemite Airport, 1300 Airport Road, Mammoth Lakes, CA 93546, Telephone: Office (760) 965-3654; Cell (760) 914-3130

Sponsor Representative.....*Soibian Spring
Airport Manager*

Responsibility and authority for contract administration

Sponsor Inspection..... *Town of Mammoth Lakes Building Department*

- Perform and/or supervise all testing and inspection services required for building and utility construction Quality Assurance.
- Review all Contractor Quality Control and Special Inspection testing and test results.

Consulting Engineer: Brandley Engineering, 6125 King Road, Suite 201, Loomis, CA 95650, Telephone (916) 652-4725, Fax (916) 652-9029

Project Manager, Principal EngineerMelissa Brandley, P.E.

- Advise and consult with Sponsor.
- Resolve any questions which may arise as to the quality and acceptability of materials furnished, work performed, and as to the manner of performance and rate of progress of the work.
- Make periodic visits to the job site to familiarize himself generally with the progress and quality of the work and to determine in general whether such work is proceeding in accordance with the contract documents.
- Review materials, equipment and performance tests for compliance with plans and specifications.

Resident Project Representative (RPR)/QA ManagerTom Steinkamp, E.I.T.

- Advise and consult with Sponsor. All Sponsor's instructions shall be issued through the Project Manager. The Project Manager shall interpret the requirements of the contract documents and judge the performance thereunder by both the Sponsor and the Contractor.
- Provide complete construction management services, including providing all resident engineering, testing, and inspection services and all required reports to the Sponsor and F.A.A. for all site work, underground utilities, foundations and concrete slab. Erection of the building and interior utilities and finishes is excluded from RPR scope of work.
- Notify the Contractor or his/her representative 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 Project Manager for his decision.
- Review concrete and asphalt mix design submitted by the contractor.

- Attend weekly construction meetings.
- Determine the amount and quality of the several kinds of work performed and materials furnished which are to be paid for under the contract.
- Approve applications for progress payments made by Contractor.
- Review and approve all Contractor submittals.
- Evaluate materials and methods of construction.
- Perform field and/or construction surveys if required.
- Prepare and assist in negotiating any required change orders.
- Perform and/or supervise all testing and inspection services including required special inspections for concrete required for site work, concrete and utility Quality Assurance. Depending on circumstances in the field, tests and inspections will be performed by RPR, Brandley Engineering inspector, or qualified outside testing laboratory.
- Schedule and oversee all Building Special Inspection testing by outside laboratory
- Review all Contractor Quality Control testing and test results.
- Prepare or review weekly and final summary test reports.

Inspector David Baltazar, E.I.T.

- Assist the RPR in all aspects of construction management including but not limited to testing and inspection services, evaluation of materials and methods of construction, and performing field and/or construction surveys if required.

Quality Assurance Testing Lab TBD

- Perform all required Special Inspections associated with steel building parts including weld inspections and high strength bolts as required.
- Provide documentation of all required Special Inspections and any required corrective actions

Architect of Record Mike Novak, NORR Associates

- Review and approve required submittals and shop drawings
- Attend periodic virtual meetings with Town, Engineer, and contractors including any required subconsultants.
- Perform general field reviews of work as appropriate to stage of construction and issue written reports regarding conditions observed
- Interpret construction documents, prepare and issue additional documents or supplementary instructions to clarify intent of documents
- Receive and respond to Town or contractor requests for supplementary information
- Prepare documents and administer changes in the construction documents
- Assist Town in review of site issues with governmental authority having jurisdiction.

- Perform monthly reviews to assess the progress of work on site and evaluate contractor's pay applications.

Quality Control (QC) Program – Contractor Responsible

Contractor: _____ *To Be Determined*

Project Superintendent..... To Be Determined

- Monitor quality control plan.
- Prepare asphalt and concrete mix design based on test results from an ASTM-certified laboratory.
- Analyze test results.
- Prepare daily and weekly summary and final summary test reports.
- Transmit test results to home office with copies to RPR.
- Make and implement corrective decisions.
- Supervise all employees and subcontractors.
- Prepare and transmit to RPR all required submittals.

Quality Control Manager To Be Determined

- Administer quality control plan.
- Prepare and submit Quality Control Program.
- Perform quality control tests on subbase course, aggregate base course, bituminous surface course, and Portland cement concrete, weld and high strength bolt inspections.
- Assemble and review test data, make statistical and trend analysis, provide corrective recommendations to Project Superintendent.
- Provide daily inspection reports and daily testing reports to RPR.
- Provide weekly typewritten summaries of all test results for each material tested to RPR.
- Provide linear control charts on aggregate base course and asphalt gradations each week.
- At the end of the project provide final typewritten summary tables showing all test results in chronological order conducted for each product.

Plant Foreman To Be Determined

- Control gradation, cement content, and temperature of the mix.
- Report all test data plus mix and cement quantities at least twice daily to Project Superintendent and/or Quality Control Manager.

Paving Foreman..... To Be Determined

- Control grade, thickness, joints, density, and surface tolerance.
- Monitor yield.

Concrete Foreman To Be Determined

- Control placement, grade, thickness, surface tolerance and finishing techniques.
- Monitor yield.

Testing Laboratory: _____

Testing Technician To Be Determined

- Perform quality control tests on all materials submitted by Contractor including native backfill, aggregate base course, Asphalt, Portland cement concrete, weld inspections and high strength bolt inspections.
- Provide test results to Quality Control Manager.
- Analyze results and provide analysis and corrective recommendations to Quality Control Manager.

Manufactured Materials – Contractor shall obtain and submit to RPR vendors' certificates of compliance with specification requirements. Vendors' certificates will be required for the following items:

- Mineral Filler and Asphalt Cement Binder
- Portland Cement
- Structural Steel
- Concrete Admixtures
- Fly Ash
- Steel
- Anchor Bolts
- Welds
- Emulsified Asphalt Prime Coat
- Emulsified Asphalt Tack Coat
- Joint Sealants

Mike Novak

RA
Associate | Studio Manager

Mike has over 15 years experience in the A/E industry. He brings his diverse architectural knowledge and experience to each of his projects. Mike has designed a wide variety of projects under various delivery methodologies. He leads multidiscipline design teams in developing options that address program challenges. His industry knowledge and experience enables him to ask the questions that pave a path for successful project performance that exceed expectations.



EDUCATION

California Polytechnic State University
San Luis Obispo, CA
• Bachelor of Architecture

PROFESSIONAL REGISTRATIONS

• Registered Architect: California – C32976

PROFESSIONAL AFFILIATIONS

- AIA Member: 2006 – 2017
- AIA Central Valley Emerging Professional Director: 2013 – 2015
- AIA National - Repositioning Ambassador: 2013 – 2014
- AIA Central Valley Director - Advocacy: 2015 – 2017
- AIA Liaison to Region Builders Trade Association: 2015 – 2017
- LEED AP: 2005 – 2015
- LEED BD+C: 2015 – 2016
- California Architects License C32976: 2011 to present

Non-profit Organizations:

- Sacramento Chamber of Commerce
- Leadership Sacramento Class of 2013
- Project Architect Boys and Girls Club Remix project

Published:

- AIACC Relevance Magazine – Serendipitous Collisions and The Future of the AIA: 2014

Recognition:

- Sacramento Business Journal – 40 under 40 list: 2014

PROFESSIONAL EXPERIENCE

NORR Experience
2018 – Present

Industry Experience
16 Years

SELECTED PROJECT EXPERIENCE

Mammoth Aircraft Rescue And Fire Fighting Building

Mammoth Yosemite Airport
Mammoth Lakes, CA

Architect Of Record

The design of this PEMB, which integrates visually with existing airport buildings, incorporates elements from the FAA grant requirements. The new MEP equipment and systems include propane storage tank, and backup power generator, and a new septic system. The sites vehicular circulation considerations include a dedicated fire lane, a vehicular road on the building's landside and an airfield apron on airside. There is also dorm room accommodations.
14,000 SF, \$9M, 2023 (est.)

Pacific Energy Center Relocation
Pacific Gas And Electric Company (PG&E)
San Ramon, CA

Project Architect

Design for a new tenant improvement in a 10,000 SF warehouse space with exhibit hall, conference areas, tool check-out, and classrooms. Systems and energy-focused project with space as an educational opportunity for building engineers. The Pandemic changed approach after CDs completed. Then provided a new storage-only TI in a different warehouse space, which supports virtual classes with tool check-out services and some hands-on services with equipment. 2021

Auburn Fleet And Warehouse
Pacific Gas And Electric Company (PG&E)
Auburn, CA

Project Architect

Phased construction of the new Warehouse (10,000 SF) and Fleet Maintenance buildings (12,000 SF), as well as design for three new structures. Also full repaving to bring older Service Center up to modern requirements. Additional covered storage structures also included for transformer, pole and spoils storage. 22,000 SF, \$7M, 2022

Fremont And Richmond Service Centers
Pacific Gas & Electric Company (PG&E)
Fremont & Richmond, CA

Architect

New vehicle wash bay building (PEMB) within both existing operating service centers, with recirculating water system.
2,000 SF (ea.), 2021

Spoils Covers Phase 2
Pacific Gas And Electric Company (PG&E)
13 Locations In California

Project Architect

Industrial metal buildings with storm-water remediation berm and apron system. Thirteen locations, each with a unique design.
3,000 – 7,000 SF, \$9M

Pacific Gas And Electric Company (PG&E)
Locations Throughout CA

Project Architect

- West Sacramento Repro
 - Burney Heliport
 - PEC Relocation – Building C
 - Redding Service Center
 - Wheatland Fence Project
 - Wheatland Restroom Building
 - Bishop Ranch Gas Control Room
 - PEC C-Lab – Contract Admin
- 2018 – Present

- Fencing Materials
- Drainage Features
- Electrical Features
- Any other required certificates

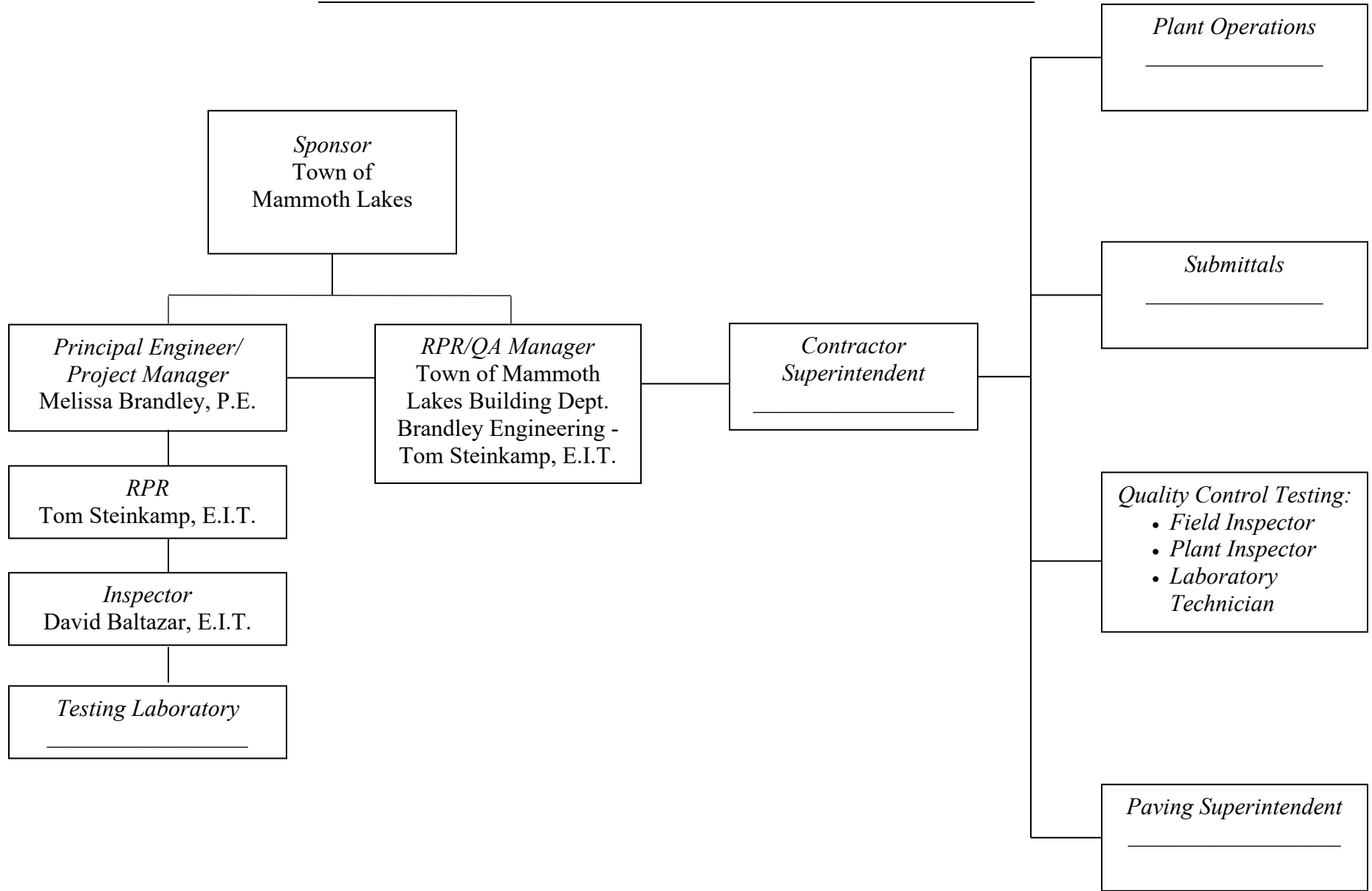
NORR

RPR's Field Office and Laboratory – All inspection and Quality Assurance testing will be performed by the Sponsor's Consulting Engineer's staff (Brandley Engineering) and Town of Mammoth Lakes Building Department with assistance from qualified testing laboratory for testing of hot mix asphalt, concrete, welds, and high strength bolts as required. Testing Laboratory is to be determined.

An office and laboratory space will be furnished on site by the Sponsor for the use of the RPR. Required laboratory test equipment will be brought to the site to allow testing of most materials. Some specialized tests will be conducted in the home office laboratory of Brandley Engineering or in the testing laboratory.

Most tests will be performed in the field laboratory so that the Contractor can have immediate access to all Quality Assurance test results.

CONSTRUCTION MANAGEMENT PLAN – ORGANIZATION CHART



III. RESUMES OF BRANDLEY ENGINEERING PERSONNEL (QUALITY ASSURANCE CONSULTANT)

MELISSA BRANDLEY, P.E.
PROJECT MANAGER/PRINCIPAL ENGINEER

EDUCATION:

Master of Engineering in Civil Engineering, Texas A&M University, August 2004.
B. Sc. in Civil Engineering, Texas A&M University, May 2003.

PROFESSIONAL REGISTRATION

State of California - Civil Engineer - No. 71139

PROFESSIONAL EXPERIENCE:

Ms. Brandley is a major partner in Brandley Engineering. She was actively involved in airport and airfield pavement design for six summers during her high school and University attendance. She has been on staff since 2004. She is experienced in the planning and design of runways, taxiways, and roads, including paving, grading, drainage, lighting, utilities, etc. She operates the AutoCAD system and has conducted construction management, testing, and inspection on airports since 2004.

REPRESENTATIVE PROJECTS:

Resident Engineer:

Chico Municipal Airport - Rehabilitate Aircraft Parking Apron Phase 1 – 2005
Lincoln Regional Airport – Crack Seal, Slurry Seal, and Remark Airfield Pavements - 2007
Chico Municipal Airport – Rehabilitate Airfield Lighting and Signage - 2007
Stockton Metropolitan Airport – General Aviation Apron and Tee Hangar Taxiway Reconstruction Phase I – 2008
Beckwourth-Nervino Airport – Runway Safety Area Grading – 2009
Placerville Airport – Crack Repair and Slurry Seal West Hangar and Apron Area, Remark Runway Blast Pads, Construct Runway Exit Taxiway – 2011
Tulelake Airport – Rehabilitation of Aircraft Parking Apron – 2012
Rogers Field, Chester, California – Reconstruct Tee Hangar Taxilanes – 2012
Cedarville Municipal Airport – Rehabilitate Airfield Pavement Joints, Slurry Seal Airfield Pavements, Construct Drainage Improvements – 2012
Visalia Municipal Airport – East Side Drainage Upgrade – 2013
Oroville Municipal Airport – North Side Apron Rehabilitation – 2013
Watsonville Municipal Airport – Reconstruct Taxiway C & GA Apron Phase 1 – 2014
Stockton Metropolitan Airport – Rehabilitate Runway & Taxiway Lighting and Signage – 2014
Tracy Municipal Airport – Reconstruct Runways and Taxiways – 2015
Madera Municipal Airport – Reconstruct General Aviation Apron Phase 2 – 2016
Tracy Municipal Airport – Reconstruct General Aviation Tie Down Apron – 2017
Oroville Municipal Airport – Construct Taxiway K – 2018
Visalia Municipal Airport – Corporate and Tee Hangars – 2019
Visalia Municipal Airport – Crack Seal Airfield Pavements – 2020
Madera Municipal Airport – Airfield Drainage Improvements – 2022
Healdsburg Municipal Airport – Remove T/W A2, Reconfigure T/W A5, Remove Old Runway Turnaround Pavement – 2023

THOMAS A. STEINKAMP, E.I.T.
RESIDENT PROJECT REPRESENTATIVE (RPR)/QA MANAGER

Education: B. Sc. in Mechanical Engineering Technology, Oregon State University, 1979

PROFESSIONAL EXPERIENCE:

Mr. Steinkamp has been actively involved in airport and airfield pavement design and construction control on airports in the Western United States for the past 36 years. He was a Soils Technician and engineering technician for a geotechnical materials testing firm for 10 years. He has over 36 years of progressive field and office experience in design and management of airfield projects in our office. He is experienced in the design of runways, taxiways, aprons, and roads, including paving, grading, drainage, lighting, utilities, etc. He prepares specifications, construction cost estimates, and operates the CAD system. Mr. Steinkamp has been responsible for construction management, testing, and inspection on several airports over the past several years.

REPRESENTATIVE PROJECTS:

Resident Project Representative:

Mammoth Yosemite Airport – Rehabilitate Taxiways and Aircraft Parking Apron – September-October 2004

Mammoth Yosemite Airport – Construct Tee Hangar Taxiways – September-October 2004

Madera Municipal Airport – Construct Hangar Apron and Taxiway, Reconstruct General Aviation Apron, Construct Road 24 & 24½ - June-November 2005

Madera Municipal Airport – Crack Seal Airfield Pavements – September 2007

Mammoth Yosemite Airport – Reconstruct Runway 9-27 & Taxiways – May-October 2008

Madera Municipal Airport – General Aviation Apron Expansion Phase 2 – October-December 2008

Madera Municipal Airport – Extend Taxiway P, Construct Holding Apron, Relocate Taxiway A – October through December 2009

Madera Municipal Airport – General Aviation Apron Expansion Phase 2B – August-November 2010

Tulelake Municipal Airport – Reconstruct Aircraft Parking Apron – July 2012

Madera Municipal Airport – Reconstruct General Aviation Apron – July-August 2013

Watsonville Municipal Airport – Reconstruct Taxiway C & GA Apron Phase 1 – June 2014

Chico Municipal Airport – Reconstruct T/W H and Apron Phase 5 – April 2015 - August 2015

Chico Municipal Airport – Reconstruct Aircraft Parking Apron Phase 3 – August-October 2016

Gansner Field – Reconstruct Runway 7-25 and Cross Taxiways – September-October 2017

Watsonville Municipal Airport – Crack Seal Runways and Taxiways – 2019

Mammoth Yosemite Airport – Reconstruct Taxiway; Slurry Seal Taxiways – 2020

Mammoth Yosemite Airport – G.A. Apron Reconstruction; Gates & Terminal Fence – 2021

Truckee Tahoe Airport – Rehabilitate Runway 2-20 and Airfield Lighting – 2023

Mammoth Yosemite Airport – Reconstruct General Aviation and Terminal Parking Lot - 2025

DAVID BALTAZAR, E.I.T. - RESIDENT INSPECTOR/TESTING TECHNICIAN

Education: B. Sc. in Mechanical Engineering, California State University, Sacramento 2007

PROFESSIONAL EXPERIENCE:

Mr. Baltazar has been involved in airfield pavement testing and inspection on airports in the Western United States for the past 16 years. He has 16 years of progressive field and laboratory experience in testing and inspection of airfield projects in our office. He is experienced in the inspection of runways, taxiways, aprons, and roads, including paving, grading, drainage, lighting, utilities, etc. Mr. Baltazar has been responsible for field and laboratory testing and inspection on several airports over the past few years.

REPRESENTATIVE PROJECTS:

Field Inspection and Testing/Resident Project Representative (RPR):

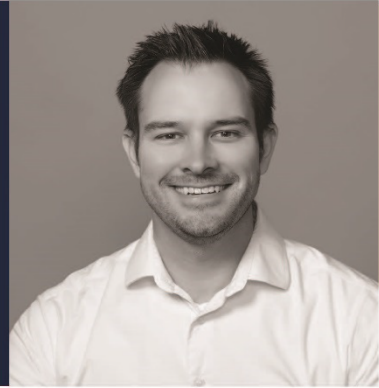
Gansner Field – Rehabilitate Taxiways and Aircraft Parking Apron – 2004
Cedarville Municipal Airport – Construct Tee Hangar Taxiways – 2005
Georgetown Airport - Reconstruct and Light Runway 16-34 – 2005
Gansner Field – Reconstruct Aircraft Parking Apron Phase 2 – 2005
Lincoln Regional Airport - Reconstruct S. T/W, Replace VASI with PAPI – 2007
Placerville Airport - Remove Obstructions, Phase 1 Hangar Area – 2007
Stockton Metropolitan Airport - Rehabilitate Runway 11R-29L – 2007
Mammoth Yosemite Airport – Reconstruct Runway 9-27 & Taxiways – 2008
Lake Tahoe Airport – Reconstruct Runway 18-36 – 2008
Lake Tahoe Airport – Reconstruct Terminal Ramp Phases 1 and 2 – 2009
Chico Municipal Airport – Rehabilitation of Aircraft Parking Aprons – 2008 through 2010
Oroville Municipal Airport – Rehabilitate Airfield Pavements – Crack Seal, Remark Airfield Markings – 2011
Tulelake Airport – Rehabilitation of Aircraft Parking Apron – 2012
Truckee Tahoe Airport – Reconstruct Runway 10-28 – 2012
Rogers Field – Joint Seal Airfield Pavements – 2013
Rogers Field- Reconstruct Tie Down Apron - 2015
Alturas Municipal Airport – Helicopter Parking Apron - November 2016
Truckee Tahoe Airport – Reconstruct Hangar Taxilanes CD and DE (East) – August 2017
Madera Municipal Airport – Crack Seal Airfield Pavements – 2018
Chowchilla Municipal Airport – Crack Seal and Slurry Seal Taxiway A and Apron – 2018
Truckee Tahoe Airport – Reconstruct Taxilane R – 2019
Truckee Tahoe Airport - Reconstruct Med Services Apron and Runway Blast Pad, Construct Wash Rack – 2020
Truckee Tahoe Airport – Reconstruct Taxiway A West & Cross Taxiways – 2021
Oroville Municipal Airport – Crack Seal Runway 2-20 and Associated Taxiways – 2022
University Airport – Reconstruct and Widen Runway 17-35 and Airfield Lighting – 2023
Truckee Tahoe Airport – Reconstruct Apron A2 - 2025

Mike Novak

RA

Associate | Studio Manager

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Auburn, CA

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Fremont And Richmond Service Centers
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Fremont & Richmond, CA

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New vehicle wash bay building (PEMB) within both existing operating service centers, with recirculating water system.
2,000 SF (ea.), 2021

Spoils Covers Phase 2
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13 Locations In California
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Industrial metal buildings with storm-water remediation berm and apron system. Thirteen locations, each with a unique design.
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Pacific Gas And Electric Company (PG&E)
Locations Throughout CA

Project Architect

- West Sacramento Repro
 - Burney Heliport
 - PEC Relocation – Building C
 - Redding Service Center
 - Wheatland Fence Project
 - Wheatland Restroom Building
 - Bishop Ranch Gas Control Room
 - PEC C-Lab – Contract Admin
- 2018 – Present

NORR

*Outside Quality Assurance Special Inspection Laboratory
(To be added once Contractor has been selected)*

IV. RESUMES OF CONTRACTOR'S QUALITY CONTROL PERSONNEL

Project Superintendent
(To be added once Contractor has been selected)

Quality Control Manager
(To be added once Contractor has been selected)

Quality Control Testing
(To be added once Contractor has been selected)

V. INSPECTION PROCEDURES AND FREQUENCIES

V. INSPECTION PROCEDURES AND FREQUENCIES

A. Surveying and Grade Control

The surveying to be included in this program will be provided by the Contractor and will be limited to that required for construction of the project. All field notes and data collected during design shall be made available to the Contractor. The survey party shall consist of a qualified party chief and survey crew. All survey equipment shall be verified for proper working operation prior to use. All required horizontal and vertical control is in place and was established in design surveys.

For horizontal control, the referenced datum is NAD83. For vertical control, the referenced datum is NAVD88. The construction monuments shall be adequately protected throughout the duration of the project.

The Contractor shall accomplish construction layout and staking by using horizontal and vertical control monuments established by the Sponsor's surveyor. The responsibility and risk associated with the construction layout shall be borne by the Contractor. The RPR will review Contractor's layouts and final grades.

During the course of the project work, the RPR will make spot checks on alignment, verify proper cross sections of the completed pavement layers, and verify final cross sections for computing final pay quantities as required. Where applicable, RPR will observe and verify Contractor's final grade surveys and utilize these data for calculating pay quantities. A copy of all Contractor's survey notes shall be given to the RPR.

B. Quality Control By Contractor – Inspection and Testing Responsibility

The Contractor is responsible for Quality Control on this project. All definable features of work will be inspected on a daily basis to ensure continuing compliance with contract requirements until completion of the particular item of work. The following inspections will be addressed:

1. The Contractor will prepare the asphalt mix design for the asphalt mix pavement proposed for use on the project. The laboratory will be accredited in accordance with ASTM D3666. The laboratory accreditation must be current and listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction.
2. The Contractor will prepare the concrete mix design for the concrete proposed for use on the project. The laboratory will be accredited in accordance with ASTM D1077. The laboratory accreditation must be current and listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction.
3. During building fabrication contractor will provide all required steel mill test reports and weld inspection by certified technicians.

4. During building erection contractor will provide all required weld and high strength bolt inspections by certified technicians.
5. During plant operation for material production, quality control test results and periodic inspections will be utilized 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 specifications. All equipment utilized in proportioning and mixing will be inspected to ensure its proper operating condition. All necessary inspections will be performed by certified technicians on a daily basis and documented.
6. During field operations, quality control test results and periodic inspections shall be utilized to ensure the quality of all materials and workmanship. All equipment utilized in placing, finishing and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance with the specifications and are within the plan dimensions, lines, grades, and tolerances specified. All necessary inspections will be performed by certified technicians on a daily basis and documented.
7. Any test results that do not meet specification requirements and any grade that is out of tolerance will be immediately reported to the Contractor's Superintendent and the RPR. Corrective measures will be implemented and new tests and inspections performed to demonstrate that corrections have been made.
8. Test reports will be prepared and transmitted to the RPR, as follows:
 - a. Daily
 - b. Weekly Summary in typewritten format - Electronic
 - c. Final Summary – Typewritten & Bound - Electronic

Failing test results will be highlighted and corrective action noted. If the weekly summary is not submitted to the RPR, the work will be shut down and the contractor will not be allowed to proceed with the work until the reports have been submitted.

9. Submittals – All required submittals will be prepared, reviewed and submitted to the RPR. Only Contractor reviewed submittals will be accepted.

C. Quality Assurance By RPR and Town of Mammoth Lakes Building Department – Inspection and Testing Responsibility

The RPR and Town of Mammoth Lakes Building Department are responsible for Quality Assurance on this project. All definable features of work will be inspected on a daily basis to ensure continuing compliance with contract requirements until completion of the particular item of work. The following inspections will be addressed:

- a. Compaction
- b. Grade and alignment
- c. Suitability test results

- d. Surface tolerance
- e. Rideability
- f. Finish grading and revegetation if necessary
- g. Pavement marking
- h. Fencing
- i. Drainage Features
- j. Electrical Features
- k. Welds and High Strength Bolts
- l. Required Special Inspections

A daily inspection report will be completed as shown in this section of the Construction Management Plan. Weekly reports (FAA Form 5370-1), along with a weekly statement of working days, will be submitted to the Sponsor, the Contractor, and the Federal Aviation Administration.

D. Quality Control Test Program

The Quality Control Test Program established for this project is shown on the Quality Control Testing Schedule included on Page VII-2.

Reports of all testing by the Contractor and RPR will be prepared daily and summarized weekly as required. Samples of the proposed daily and weekly report forms are included on the following pages.



Report No. _____

INSPECTION REPORT

☒ Daily
☐ Weekly
☐ Monthly

AIRPORT: Mammoth Yosemite Airport

DATE: _____

PROJECT: Multipurpose Building – Phase 2

WEATHER: _____

AIP NO.: 3-06-0146- 0 -2026

TEMPERATURE: min _____ max _____

CONTRACTOR: _____

WORKING DAY: yes { } no { }

Contract Working Days _____

A. EARTHWORK

1. { } Clearing and Grubbing (P-151) _____
2. { } Excavation and Embankment (P-152) _____
3. { } Scarify and Recompact Subgrade (P-152) _____
4. { } Subbase Course (P-154) _____
5. { } _____

B. FLEXIBLE BASE COURSE

6. { } Crushed Aggregate Base Course (P-209) _____
7. { } _____

C. RIGID BASE COURSE

8. { } Asphalt Surface Coarse (P-401) _____
9. { } Concrete (P-610) _____

D. MISCELLANEOUS PAVING

10. { } Emulsified Asphalt Prime Coat (P-602) _____
11. { } Emulsified Asphalt Tack Coat (P-603) _____
12. { } Concrete Valley Gutter (P-610) _____
13. { } Concrete Sidewalk with Curb and Pedestrian Ramp (P-610) _____
14. { } _____

E. MARKING

15. { } Marking (P-620) _____
16. { } Roadway/Parking Lot Signs and Sign Posts (P-620) _____
17. { } _____

F. FENCING

18. { } Chain Link Fence (F-162) _____
19. { } Fiber Optic Cable (F-162) _____
20. { } _____

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING – PHASE 2
AIP 3-06-0146-0__-2026**

INSPECTION REPORT (Continued)

Page No. 2

Dated: _____

G. DRAINAGE

- 21. { } HDPE Storm Drain (D-701) _____
- 22. { } HDPE Flared End Section (D-701) _____
- 23. { } Combination Inlet/Oil-Water Separator (D-751) _____
- 24. { } Rip Rap (D-752) _____
- 25. { } _____

H. ELECTRICAL

- 26. { } Underground Power Cable for Airports (L-108) _____
- 27. { } Underground Electrical Duct Banks and Conduits (L-110) _____
- 28. { } Electrical Junction Structures (L-115) _____
- 29. { } _____

I. BUILDING FABRICATION AND ERECTION

- 30. { } 03 Concrete _____
- 31. { } 05 Metals _____
- 32. { } 06 Wood, Plastics, and Composites _____
- 33. { } 07 Thermal and Moisture Protection _____
- 34. { } 08 Openings _____
- 35. { } 09 Finishes _____
- 36. { } 10 Specialties _____
- 37. { } 11 Equipment _____
- 38. { } 13 Special Construction (Building) _____
- 39. { } 21 Fire Suppression _____
- 40. { } 22 Plumbing _____
- 41. { } 23 HVAC _____
- 42. { } 26 Electrical _____
- 43. { } 28 Electrical Safety and Security _____
- 44. { } _____

J. UTILITIES

- 45. { } Potable Water Pipeline and Appurtenances (331416) _____
- 46. { } Gravity Sewage, Septic Tank, and Appurtenances (333113) _____
- 47. { } _____

K. MISCELLANEOUS

- 48. { } _____
- 49. { } _____

MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING – PHASE 2
AIP 3-06-0146-0__-2026

INSPECTION REPORT (Continued)

Page No. 2

Dated: _____

REMARKS:


CONTRACTOR’S PERSONNEL/EQUIPMENT ON SITE	
EQUIPMENT	PERSONNEL
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Visitors: _____

Personnel: _____

Date: _____

By: _____

 U.S. Department of Transportation Federal Aviation Administration		Construction Progress and Inspection Report Airport Grant Program		Period Ending
				Project Number AIP 3-06-0146-_-2026
Airport Name Mammoth Yosemite Airport, Mammoth Lakes, Mono County, California				
Project Description Multipurpose Building - Phase 2			Contractor's Name	
1. Contract Time	No. Days Charged to Date	Last Working Day Charged (Date)		
2. Brief Weather Summary this Period, including Approximate Rainfall and Periods of Below Freezing Temperature (On earthwork jobs, include soil conditions.)				
3. Rough Estimate of Percent Completion to Date of Construction Phases (Include items such as clearing, grading, drainage, base, surface, lighting, etc.)				
4. Work Completed or In Progress this Period				
5a. Summary of Laboratory and Field Testing this Period (Note failing tests and any retests. Summarize out-of-tolerance.)				
5b. Material (Identify material subject to pay reduction.)				
6. Description of Anticipated Work by Contractor for Next Period				
7. Problem Areas/Other Comments (Include revisions to plans and specifications approved or denied, delays, difficulties, etc. and actions taken.)				
SPONSOR'S INSPECTOR OR REPRESENTATIVE				
Date	Typed or Printed Name and Title		Signature	



6125 KING ROAD, SUITE 201 · LOOMIS, CALIFORNIA 95650 · P. (916) 652.4725

WEEKLY STATEMENT OF WORKING DAYS

AIRPORT:	Mammoth Yosemite Airport	DATE:	
PROJECT:	Multipurpose Building - Phase 2	AIP NO:	3-06-0146-0 -2026

TO: (Contractor) _____

The following statement shows the number of working days charged to your contract for the week ending _____.

Date Contract Approved	
Date of First Chargeable Working Day	
Date Contractor Began Work	
Working Days Specified in Contract	115 working days
Time Extensions by Approved Change Order	0
Total Authorized Working Days	0
Total Authorized Calendar Days	-
Date Job Shutdown due to Weather Conditions	-
Date Job Resumed	-

DATE	DAY	WEATHER OR CONDITIONS	WORKING DAY CHARGED	Nonworking Day Caused by Weather or *Other Conditions
	Saturday			
	Sunday			
	Monday			
	Tuesday			
	Wednesday			
	Thursday			
	Friday			
Days this Week				
Days Previously Reported		0		
Total Days to Date		0		

Working Days Remaining to Complete Contract	0
Project Completion this Week	0%
Project Completion to Date	0%
Contract Time Elapsed	

Note: The Contractor will be allowed 15 days to protest in writing the correctness of this statement; otherwise, the statement shall be deemed to have been accepted by Contractor.

RESIDENT PROJECT REPRESENTATIVE

* Remarks: _____

VI. SUBMITTAL PROCESS

VI. SUBMITTAL PROCESS

At the Preconstruction Conference, the Contractor will provide a listing of all submittals required for the project for approval by the RPR. The listing can be developed in a spreadsheet format and shall include:

- a. Specification item number
- b. Item description
- c. Description of submittal
- d. Specification paragraph requiring submittal
- e. Scheduled data of submittal

After approval of this list, individual submittals will be submitted to the RPR for approval a minimum of 10 calendar days before use, installation, or construction. Contractor shall review and approve all submittals prior to submittal to RPR. Any submittal that does not include Contractor's review and approval signature will not be accepted. The RPR will review submittals and return them to the Contractor either approved or rejected. No materials will be delivered to the project until submittals are approved.

Certificates of compliance for all manufactured or prefabricated materials shall be delivered to the RPR.

Upon delivery to the site, the RPR will inspect each item to assure that it is the same as the approved submittal.

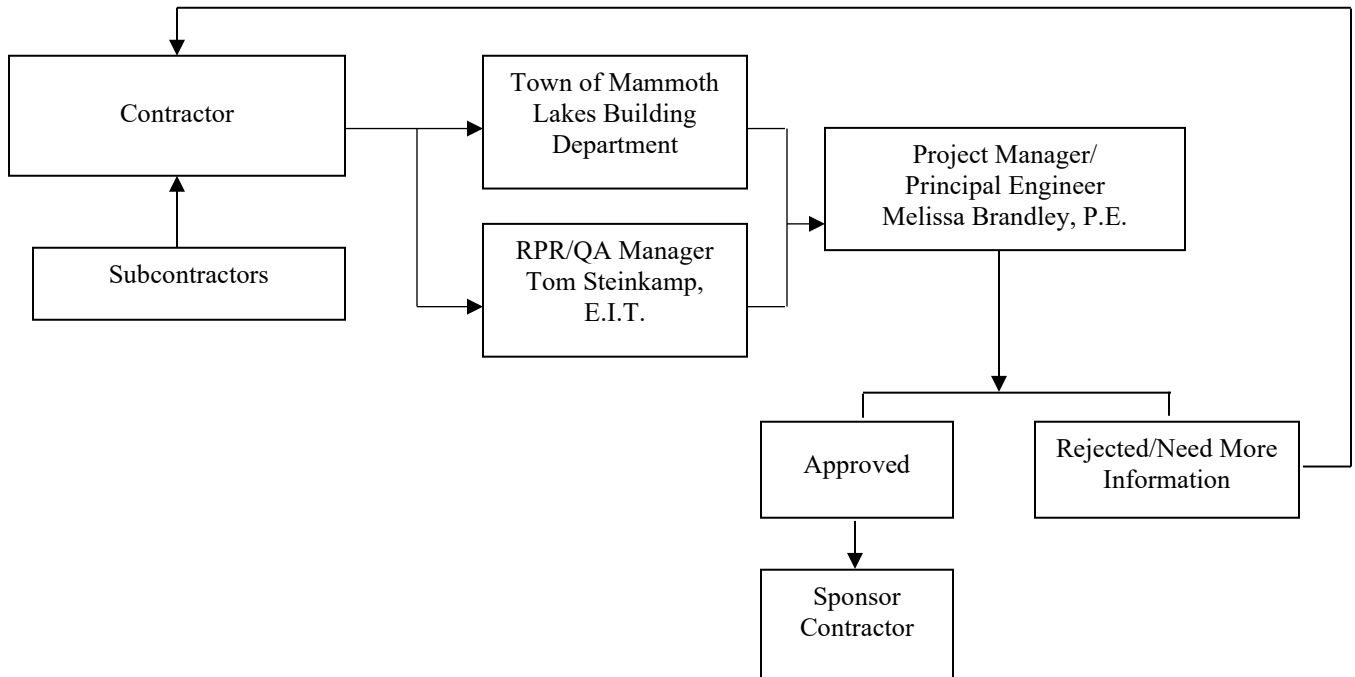
The Submittal Schedule and review path are shown on the following pages.

SUBMITTAL SCHEDULE					
Bid Item	Item Description	Type Submittal	Project Spec.	Material Specification	Title
--	Construction Schedule	CMP	--	N/A	N/A
--	List of Materials/Schedule of Values	List	SC (20)b/d	N/A	N/A
--	Safety Plan Compliance Document	Manual	SC (19)a	N/A	N/A
--	Contractor Quality Control Program	Manual	C-100	N/A	N/A
1	Storm Water Pollution Prevention Plan	Plan/Permit	C-103	N/A	N/A
7	Subbase Course (P-154)	Suitability Tests	154-2.1	ASTM D1883	California Bearing Ratio (CBR)
		Gradation		C 136 & C 117	Sieve Analysis
8	Crushed Aggregate Base Course (P-209)	Suitability Tests	209-2.1	ASTM C131 ASTM C88 ASTM D5821 ASTM D4791 ASTM C142 ASTM D4318 ASTM D1883	LA Rattler Sodium Sulfate Soundness Fractured Particles Flat or Elongated Particles Clay Lumps and Friable Particles Liquid Limit and Plasticity Index California Bearing Ratio (CBR)
				Gradation	209-2.2 C 136 & C 117 Sieve Analysis
9	Asphalt Surface Course (P-401)	Aggregate Suitability Tests - Coarse Aggregate	401-2.1a	ASTM C 88 ASTM D5821 ASTM C 131 ASTM C142 ASTM D4791	Sodium Sulfate Soundness Fractured Particles LA Rattler Clay Lumps and Friable Particles Flat or Elongated Particles
		Aggregate Suitability Tests - Fine Aggregate	401-2.1b	ASTM D4318 ASTM C88 ASTM D2419 ASTM D1073	Liquid Limit and Plasticity Index Sodium Sulfate Soundness Sand Equivalent Natural Sand
		Mineral Filler	401-2.2	ASTM D242 ASTM D4318	Mineral Filler Plasticity Index
		Asphalt Binder - Certificate	401-2.3	ASTM D6373	Asphalt Binder
		Anti-Strip Agent	401-2.4	N/A	N/A
		JMF Laboratory	401-3.2	ASTM D3666	Agencies Testing & Inspection Road & Paving Materials
		Air Voids Percent VMA Tensile Strength Gradation Job Mix Formula Marshall Tests	401-3.3	ASTM D3203 ASTM D6995 ASTM D4867 C 136 & C 117 N/A Asphalt Institute MS-2	Air Voids Percent Voids in Mineral Aggregate (VMA) Effect of Moisture on AC Mixtures Sieve Analysis N/A Marshall Method of Mix Design
		Asphalt Pavement Analyzer or Hamburg Wheel Test	401-3.3	AASHTO T340 AASHTO T324	Rutting Susceptibility of HMA Using APA Hamburg-Wheel-Track Testing of Compacted AC
		Certificate	602-2.1	ASTM D977	Emulsified Asphalts
		Certificate	603-2.1	ASTM D977	Emulsified Asphalts
--	Joint Sealant Material (P-605)	Certificate	605-2.1	ASTM D 5893 ASTM D 6690	Joint Sealant Joint and Crack Sealants, Hot Applied
--	Backer Rod (P-605)	Product Data	605-2.2	N/A	N/A
12-13	Concrete (P-610)	Alkali-Silica Reaction	610-2.1	ASTM C 1260	Alkali Reactivity
		Aggregate - Coarse	610-2.2	ASTM C33	Concrete Aggregates
		Gradation - Coarse	610-2.3	ASTM C 136	Sieve Analysis
		Aggregate - Fine	610-2.4	ASTM C33	Concrete Aggregates
		Cement - Certificate	610-2.4	ASTM C 150	Portland Cement
		Cementitious Materials	610-2.5	ASTM C618 ASTM C989	Fly Ash Slag Cement
		Admixtures	610-2.7	ASTM C260 ASTM C 494 ASTM C494	Air-entraining Admixtures Water-reducing Admixtures Chemical Admixtures
		Premolded Joint Material	610-2.8	ASTM D 1751 ASTM D 1752	Preformed Expansion Joint Filler Preformed Sponge Rubber & Cork Joint Filler
14	Roadway/Parking Lot Signs (P-620)	Steel Reinforcement	610-2.10	ASTM A615	Deformed Bars
		Concrete Curing - Certificates	610-2.11	ASTM C 309	Liquid Membrane Forming Compounds
15	Sign Posts (P-620)	Product Data	620-2.4	N/A	N/A

MAMMOTH YOSEMITE AIRPORT - MULTIPURPOSE BUILDING - PHASE 2 - AIP 3-06-0146-0 __-20__					
SUBMITTAL SCHEDULE					
Bid Item	Description	Type Submittal	Project Spec.	Material Specification	Title
16	Fence Fabric (F-162)	Certificate	162-2.1	ASTM A 392	Zinc-Coated Steel Chain-Link Fence Fabric
	Posts, Rails and Braces (F-162)	Product Data	162-2.3	N/A	N/A
		Certificate	162-2.3	Fed Spec RR-F-191/3	Fencing, Wire and Post, Metal (Posts, Top Rails and Braces)
	Chain Link Fence and Gates (F-162)	Certificate	162-2.3-2.4	ASTM F1043 ASTM F1083	Protective Coatings Pipe for Fence Structures
	Wire Ties and Tension Wires (F-162)	Product Data/Cert	162-2.5	ASTM A824	Tension Wire
		Certificate	162-2.5	Fed Spec RR-F-191/4	Fencing, Wire and Post, Metal (Accessories)
17	Miscellaneous Fittings and Hardware (F-162)	Product Data/Cert	162-2.6	ASTM A 153	Zinc Coating on Iron and Steel Products
	HD Polyethylene Plastic Pipe (D-701)	Certificate	701-2.2	ASTM F714	Polyethylene (PE) Plastic Pipe (DR-PR)
	Rubber Gaskets (D-701)	Certificate	701-2.4	ASTM C443	Joints for Concrete Pipe & Manholes, Using Rubber Gaskets
	Joint Mortar (D-701)	Certificate	701-2.5	ASTM C 150/C 144	Portland Cement/Sand
	Joint Fillers (D-701)	Certificate	701-2.6	ASTM D 6690	Joint and Crack Sealants, Hot Applied
	Plastic Gaskets (D-701)	Certificate	701-2.7	ASTM C990	Joints for Concrete Pipe
	Precast Box Culverts (D-701)	Certificate	701-2.9	ASTM C1433	Precast Reinforced Concrete Monolithic Box Sections
18	Flared End Sections (D-701)	Certificate	701-2.11	CalTrans 70-05.02B(4)	Plastic Flared End Sections
19	<i>Inlets/Oil Water Separator</i>				
	Mortar (D-751)	Certificate	751-2.2	ASTM C150	Portland Cement
	Manhole Rings (D-751)	Certificate	751-2.4	ASTM C478	Precast Reinforced Concrete Manhole Sections
	Gaskets (D-751)	Certificate	751-2.4	ASTM C443	Joints for Concrete Pipe and Manholes
	Corrugated Metal (D-751)	Certificate	751-2.5	AASHTO M36	Corrugated Steel Pipe, Metallic-Coated
	Gray Iron Castings (D-751)	Certificate	751-2.6	ASTM A48	Gray Iron Castings
	Malleable Iron Castings (D-751)	Certificate	751-2.6	ASTM A47	Ferritic Malleable Iron Castings
	Steel Castings (D-751)	Certificate	751-2.6	ASTM A27	Steel Castings, Carbon
	Structural Steel (D-751)	Certificate	751-2.6	ASTM A283	Tensile Strength Carbon Steel Plates
	Ductile Iron Castings (D-751)	Certificate	751-2.6	ASTM A536	Ductile Iron Castings
20	Rip Rap	Certificate	752-2.2	ASTM C 127	Relative Density and Absorption of Coarse Aggregate
		Certificate	752-2.2	California 229	Durability Index
		Certificate	752-2.2	ASTM C 88	Soundness of Aggregates by Use of Sodium Sulfate
		Certificate	752-2.2	Average Loss	N/A
		Gradation	752-2.2	C 136 & C 117	Sieve Analysis
ARFF/SRE Building and Appurtenances See Technical Provisions - Submittals					
<i>Deferred Submittals</i> <u>Architectural:</u> Pre-engineered metal building and second floor slabs propane tank <u>Structural</u> Prefabricated metal building Sprinklers					

MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2
AIP NO. 3-06-0146-0__-2026

PATH FOR REVIEW AND APPROVAL OF SUBMITTALS



VII. QUALITY CONTROL TESTING

VII. QUALITY CONTROL TESTING

Quality Control Testing will be performed under the direction of the Contractor and will be reviewed by the RPR and Town of Mammoth Lake Building Department.

The Quality Control Testing Schedule, flow path, and corrective action plan proposed for this project are shown on the following pages.

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING - PHASE 2**

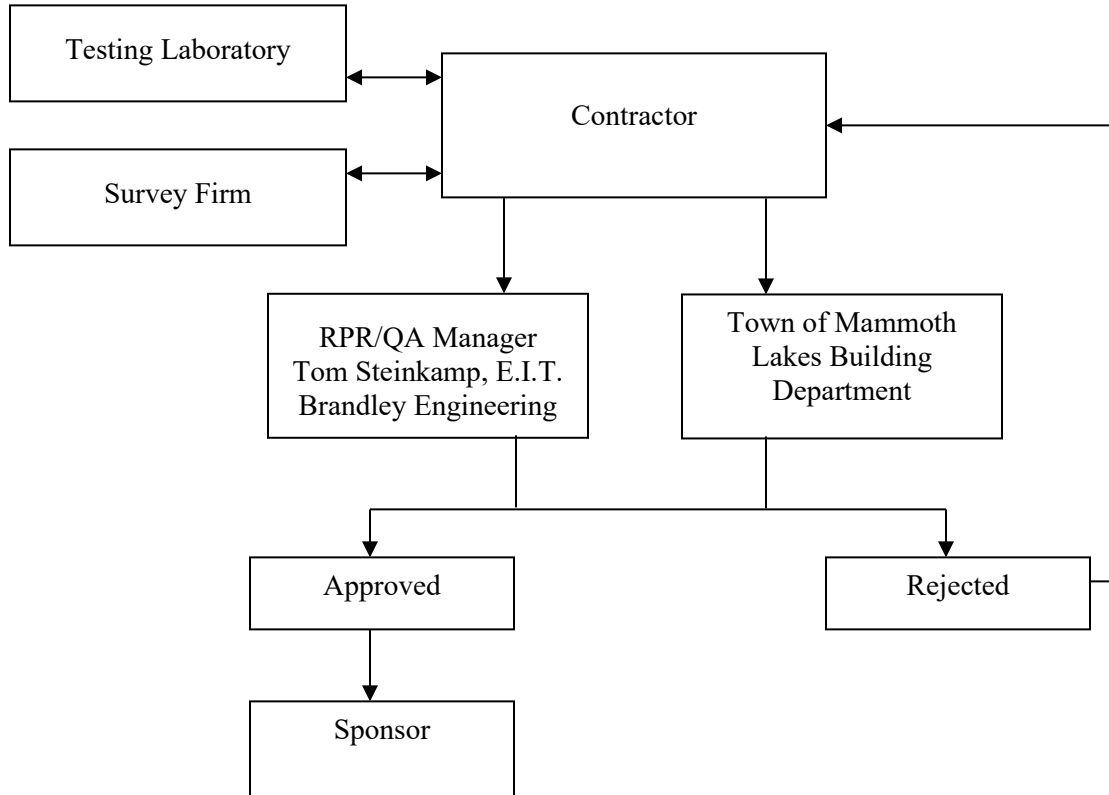
QUALITY CONTROL TESTING SCHEDULE

Spec. No.	Material	Min Frequency	Testing	ASTM	Title
P-152	Excavation		Laboratory Compaction Test		
		1/1,000 SY	Field Density Test - Nuclear (Control)	D1556 D 6938	In-Place Density - Sand Cone In-Place Density - Nuclear
P-152	Scarify and Recompact Subgrade	1/1,000 SY	Field Density Test - Nuclear (Control)	D1556 D6938	In-Place Density - Sand Cone In-Place Density - Nuclear
		50-foot grid	Field Surface Tolerance	N/A	N/A
P-154	Subbase Course	1/day	Control Gradation (Production)	C 117 C 136	Materials Finer than 75-µm Sieve Sieve Analysis - Fine & Coarse Aggregates
		2/1,200 SY	Laboratory Compaction Test	D 1557	Laboratory Compaction
		50-foot grid	Surface Tolerances - Smoothness/Grade	N/A	N/A
		2/1,200 SY	Field Density Test - Nuclear (Control)	D1556 D 6938	In-Place Density - Sand Cone In-Place Density - Nuclear
		2/1,200 SY	Thickness	N/A	N/A
			Aggregate Suitability Tests*		
P-209	Aggregate Base Course	2/day	Control Gradation (Production)	C 117 C 136	Materials Finer than 75-µm Sieve Sieve Analysis - Fine & Coarse Aggregates
		25-foot grid	Field Surface Tolerance	N/A	N/A
		2/1,200 SY	Laboratory Compaction Test	D 1557	Laboratory Compaction
		2/1,200 SY	Field Density Test - Nuclear (Control)	D1556 D 6938	In-Place Density - Sand Cone In-Place Density - Nuclear
		2/1,200 SY	Thickness	N/A	N/A
			Aggregate Suitability Tests*		
P-401	Asphalt Surface Course		Job Mix Formula (Item 401-3.2)	--	--
		As Necessary	Asphalt Pavement Analyzer or Hamburg Wheel Test	T340 or T324	--
		2/Day	Control Gradation (Production)	C117/C136/ D544	Sieve Analysis
		2/Day	Asphalt Content	D6307	AC Content - Ignition Method
		1/Day	Moisture Content of Aggregates	D2172	Extraction of Bitumen from Mixtures
		1/Day	Moisture Content of Asphalt	C 566 D 1461	Moisture Content of Aggregate Moisture Distillates in Mixture
		4/Day	Temperatures	N/A	N/A
		1/Sublot	Field Test Cores	D 3665	Random Sampling of Materials
		As Necessary	Field Density Test - Nuclear (Control)	D 2950	Density of Bituminous Concrete
		Daily	Smoothness	N/A	N/A
		Daily	Grade	N/A	N/A
P-610	Structural PCC		Aggregate Suitability Tests*	--	--
F-162	Chain Link Fence and Gates		Check Alignment and Installation	N/A	N/A
D-701	HDPE Storm Drain		Compaction of Backfill - Nuclear (Control)	D1556 D 6938	In-Place Density - Sand Cone In-Place Density - Nuclear
	Rebar				
	Anchor Bolts				
	Welding				
	Mill Test Report (MTR)				

*See Submittal Schedule

MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2
AIP NO. 3-06-0146-0__-2026

FLOW CHART – QUALITY CONTROL RESPONSIBILITIES
(Between Testing Laboratory, Contractor, and Resident Project Representative)



QUALITY CONTROL CORRECTIVE ACTION PLAN

In the event that inspection or test results indicate unsatisfactory production or construction processes, immediate action will be taken. Corrective actions may range from a minor process adjustment to temporary termination of production. Correction action options are contained in this section of the Construction Management Plan.

Corrective actions will be taken each time that inspection or testing results show a material quality or process to be out of compliance. When any tests fall outside tolerance levels, an appropriate investigation will be set up to determine the cause and bring the material back into tolerance. Where two consecutive tests are outside tolerance levels, then Contractor will take immediate corrective action. This corrective action will occur regardless of its impact upon production. If three consecutive tests are out of specification, then production will immediately be halted and will not resume until it is demonstrated that all requirements can be met. Production will recommence upon approval of the RPR.

<u>Item Description</u>	<u>Corrective Action</u>
<i>SUBGRADE - ITEM P-152:</i>	
Density	If test results are outside the tolerances set forth in Item P-152 of the specifications, 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.
Surface Tolerances	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. Subbase course will not be placed until the corrections have been made and the RPR has inspected and approved.
<i>SUBBASE COURSE – ITEM P-154:</i>	
Density	If the specified density is not attained, the area represented by the failed test shall be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached.
Gradation	If test results are outside the tolerances set forth in Item P-154 and P-207 of the specifications, an immediate investigation will be conducted to determine the cause. Corrections will be made and material will be tested immediately to assure that the correction has been effective.
Surface Tolerances	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

<u>Item Description</u>	<u>Corrective Action</u>
Thickness	<p>required smoothness and accuracy are obtained and approved by the RPR</p> <p>Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade.</p>

AGGREGATE BASE COURSE – ITEM P-209:

Gradation	If test results are outside of the tolerances set forth in Item P-209 of the specifications, an immediate investigation will be conducted to determine the cause. Corrections will be made and material will be tested immediately to assure that the correction has been effective.
Finished Grade	If finished grade of aggregate base is outside limits, then the surface will be regraded before bituminous surface course is placed. asphalt surface course will not be placed until the corrections have been made and the QC Manager has inspected and approved.
Percent Crushed	If test results are outside the limits set forth in Item P-209 of the specifications, an immediate investigation will be conducted to determine the cause. Corrections will be made, and material will be tested immediately to assure that the correction has been effective.
Density of AB in-Place	If the field density of aggregate base in-place determination indicates that the aggregate base is not being placed to a minimum of the required maximum density of the lab specimen, immediate action will be taken. Corrections will be made, and material will be tested immediately to assure that the correction has been effective.

ASPHALT SURFACE COURSE – P-401:

Surface Tolerance	If the finished surface varies more than 1/4” when tested with a 12-foot straightedge, immediate action will be taken to bring finish surface within the specified tolerance. If the completed thickness is deficient by more than 1/4” of the design thickness, corrective action will be taken by excavating to the required depth and replacing with new material. If the completed thickness is thicker and/or surface straightedge tolerances are exceeded, RPR will evaluate suitability of finished product and Contractor may be requested to grind the surface or remove and replace the AC pavement.
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<u>Item Description</u>	<u>Corrective Action</u>
Asphalt Content	If one point falls outside the suspension limit of $\pm 0.70\%$, or two consecutive points fall outside the action limit of $\pm 0.45\%$, an immediate investigation will be conducted to determine the cause. Corrections will be made and material will be tested immediately to assure that the correction has been effective.
Aggregate Gradation	If test results are outside of limits set forth in the control charts in paragraph 401-6.5 of the specifications, an immediate investigation will be conducted to determine the cause. Corrections will be made and material will be tested immediately to assure that the correction has been effective.
Aggregate Moisture	When individual or composite aggregate moisture values differ from those of the plant computer, the plant computer will be adjusted to reflect the most recent aggregate moisture.
Asphalt Temperature	If the asphalt temperature is not sufficient to provide adequate coating of aggregate particles or the asphalt temperature exceeds 325°F (148°C) the plant operator will immediately take corrective action to raise or lower the temperature as needed. Temperature will be closely monitored to verify that the correction was adequate.
Aggregate Temperature	If the aggregate and mineral filler temperature exceeds 347°F (175°C) when asphalt is added, the plant operator will immediately take corrective action to lower the temperature as needed. Temperature will be closely monitored to verify that the correction was adequate.
Mix Moisture Content	If the mix moisture exceeds 0.5% , the plant operator will be notified and corrective action will be taken to reduce the moisture in the mix. Aggregate piles may be spread to dry, aggregate time in the heater may be increased, etc.
Aggregate Base Preparation (P-209)	If the inspection indicates that the aggregate base is not compacted to 100% maximum density under areas to be paved, immediate action will be taken. Aggregate base problems will be corrected – dried, cleaned, compacted, graded, etc. Asphalt concrete will not be placed until the corrections have been made and the QC and QA Managers have inspected and approved.
Prime and Tack Coat (P-602 and P-603)	If inspection indicates that the prime and/or tack coat material or application is not in accordance with the specifications, immediately action will be taken. Prime/Tack coat will be re-applied, changed, time for “break” will be lengthened, etc. Bituminous surface course will not be placed until the corrections have been made and the RPR has inspected and approved.

<u>Item Description</u>	<u>Corrective Action</u>
Base Temperature	If the surface temperature is less than specified in Table 4 of paragraph 401-4.1 of the specifications, bituminous mixture will not be placed unless approved by the RPR.
Mix Temperature	If physical measurements indicate that the mix temperature is below the specified temperature, corrective action will be taken immediately. Cool mix will be returned to the plant and the operation will be changed to correct the situation that is causing the problem. AC will be held in tarped trucks and not windrowed until necessary.
In-Place Density	If field density determination indicates that the bituminous surface course is not being placed to a minimum theoretical maximum density of the mat at 92.8% or joint of 90.5%, immediate action will be taken. Roller operations will be investigated and may be changed, plant will be notified and mix quality will be examined, temperature will be determined, etc. Density will be tested immediately following the corrective action to assure that the action has been effective. If a lot does not equal 90 percent within limits (PWL) of the compaction of both mat and joints, corrective action will be taken to increase the degree of compaction.
Air Voids	If the lot does not have air voids within the limits (PWL) of Table 5 of paragraph 401-5.2 of the specifications, the reason shall be determined and corrective action will be taken.
Surface Smoothness	If the finished surface varies more than 3/8" for base course and 1/4" of surface course using a 12-foot straightedge, corrective action will be taken. If more than 15% of all measurements within a lot exceed these tolerances using methods set forth in the specifications, then corrective action will involve removing deficient material and replacing with new. High points will be ground off when required.
Re-sampling Pavement	Corrective action for pavement items may include re-sampling of pavement.

STRUCTURAL PORTLAND CEMENT CONCRETE – (P-610):

Compressive Strength	If the test specimens fail to conform to the requirements for strength, changes shall be made to the concrete mixture to increase the strength to meet the requirements. When a given lot of concrete fails to meet the minimum requirements the entire lot shall be replaced at the Contractor's expense.
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Item Description

Corrective Action

Defective Work

Any defective work discovered after the forms have been removed, which in the opinion of the Engineer cannot be repaired satisfactorily, shall be immediately removed and replaced at the expense of the Contractor. Defective work shall include deficient dimensions, or bulged, uneven, or honeycomb on the surface of the concrete.

BUILDING CONSTRUCTION

Weld Installation

If a weld fails to conform to the requirements for proper weld installation, the weld shall be removed and reinstalled to proper standards.

High Strength Bolt
Installation

If a high strength bolt installation fails to conform to the requirements for proper high strength bolt installation, the high strength bolt shall be removed and replaced.

Defective Work

Any defective work discovered after the forms have been removed, which in the opinion of the Engineer cannot be repaired satisfactorily, shall be immediately removed and replaced at the expense of the Contractor. Defective work shall include deficient dimensions, or bulged, uneven, or honeycomb on the surface of the concrete.

VIII. QUALITY ASSURANCE TESTING

VIII. QUALITY ASSURANCE TESTING

Quality Assurance Testing and Inspection will be performed by or under the direction of the RPR and Town of Mammoth Lakes Building Department. Quality Assurance Testing, as a minimum, will include all final acceptance testing to make sure the final product is within specification limits and to determine pay factors for each item.

The Quality Assurance Testing Schedule, flow path charts, and pay factors are included on the following pages.

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING - PHASE 2**

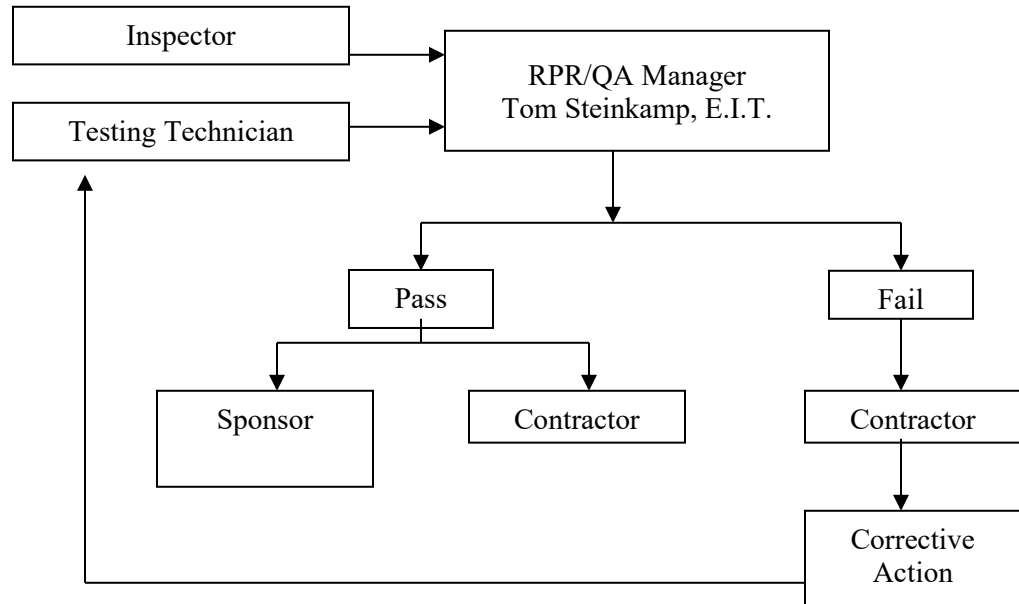
QUALITY ASSURANCE TESTING SCHEDULE

Spec. No.	Material	Min Frequency	Testing	ASTM	Title
P-152	Excavation	1/1,000 SY	Field Density Acceptance Test - Sand Cone	D 1557	Laboratory Compaction
P-152	Scarify & Recompact Subgrade	1/1,000 SY	Field Density Acceptance Test - Sand Cone	D 1557	Laboratory Compaction
P-154	Subbase Course	2/1,200 SY 50-foot grid	Field Density Acceptance Test - Sand Cone Field Surface Tolerance	D 1557 N/A	Laboratory Compaction N/A
P-209	Aggregate Base Course	2/day	Field Gradation (Delivery)	C 136	Sieve Analysis
			Field Percent Crushed		
		25-foot grid	Field Surface Tolerance(1)	N/A	N/A
		2/1,200 SF	Field Density Moisture Content	D 1557	Laboratory Compaction
		2/1,200 SF	Field Density Acceptance Test - Sand Cone	D 1557	Laboratory Compaction
P-401	Asphalt Surface Course	4/day	Field Temperature	N/A	N/A
		1/sublot	Field Density, Voids, From Cores - Mat & Joint		
		1/sublot	Bulk Specific Gravity	D2726	Bluk Specific Gravity & Density
		1/sublot	Air Voids	D3203	Percent Air Voids
		Daily	Grade	N/A	N/A
		Daily	Thickness	N/A	N/A
		Daily	Smoothness	N/A	N/A
P-602	Emulsified Asphalt Prime Coat		Spread	N/A	N/A
P-603	Emulsified Asphalt Tack Coat		Spread	N/A	N/A
P-610	Concrete	Each Day's Placement	Slump	C143	Slump - Hydraulic Cement
			Air Content	C231	Air Content Freshly Mixed Concrete
			Compressive Strength	C39	Compressive Strength
		Periodic	Post Installed Anchors Review Mix Designs		California Building Code 1705.3
		Continuous	Reinforcing Placement		
P-620	Airfield Marking		Check Layout and Coverage	N/A	N/A
F-162	Chain Link Fence and Gates		Check Alignment and Installation	N/A	N/A
D-701	HDPE Storm Drain		Compaction of Backfill - Sandcone(Acceptance) Check compliance Certification	D 1557	Laboratory Compaction
L-115	Junction Structure		Check Installation	N/A	N/A
--	Steel Construction		Shop Welding Field Welding High Strength Bolting		California Building Code 1705.2
--	Seismic Resistance		Structural Steel		California Building Code 1705.12.1
--	Testing for Seismic Resistance		Structural Steel		California Building Code 1705.13.1

MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2

FLOW CHART – QUALITY ASSURANCE RESPONSIBILITIES

(Between Testing Laboratory, Resident Project Representative, and Contractor)



PAY FACTORS

Subgrade, Subbase Course, Aggregate Base Course - If grade is high, the Contractor shall remove this excess material at no cost to the Owner. If grade is more than 1/2-inch low, the existing section shall be scarified, additional material added, and the total section recompacted.

Asphalt Surface Course – Basis of Adjusted Payment - The pay factor for each individual lot shall be calculated in accordance with the Price Adjustment Schedule shown below. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

PRICE ADJUSTMENT SCHEDULE	
Percentage of Material Within the Specification Limit (PWL)	Lot Pay Factor (Percent of Contract Unit Price) ¹
96-100	106
90-95	PWL + 10
75-89	0.5 PWL + 55
55-74	1.4 PWL – 12
Below 55	Reject ²
¹ Although it is theoretically possible to achieve a pay factor of 106 percent for each lot, actual payment above 100 percent shall be subject to the total project payment limitation specified in paragraph 401-8.1.	
² The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.	

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. The total project payment for plant mix asphalt pavement shall not exceed 106 percent of the product of the contract unit price and the total number of tons of asphalt used in the accepted work. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with specification requirements after correction for over 25% of the sublot shall be reduced by 5%.

Other Materials – Payment for accepted other materials, such as prime coat, tack coat, fencing, drainage features, and electrical features will be measured in place and paid for at unit prices bid.

IX. TEST RESULT DOCUMENTATION

IX. TEST RESULT DOCUMENTATION

A. Quality Control Tests and Inspections

The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required 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 Engineer daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the Contractor's Program Administrator.

The Contractor shall be responsible for establishing a system which will record all quality control 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. The Contractor shall maintain statistical quality control charts. The daily test reports shall be signed by the responsible Quality Control Manager and the Contractor.

Each week the Contractor will provide Summary Reports to the RPR in electronic format for testing on each product – subbase, base, pavement, etc.

Each Contractor Quality Control Manager shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations on a form acceptable to the Project Engineer. These technician's daily inspection reports shall provide factual evidence that continuous quality control inspections have been performed and shall, as a minimum, include the following:

- (1) Technical specification item number and description;
- (2) Weather conditions;
- (3) Compliance with approved submittals;

- (4) Proper storage of materials and equipment;
- (5) Proper operation of all equipment;
- (6) Adherence to plans and technical specifications;
- (7) Summary of any necessary corrective actions;
- (8) Safety inspection; and
- (9) Photographs and/or video.

The daily inspection reports shall identify inspections 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 Quality Control Manager and the Contractor. The RPR shall be provided at least one copy of each daily inspection report before the work starts on the following day of record. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Program has been approved by the RPR.

B. Quality Assurance Tests and Inspections

The RPR shall maintain current quality assurance records of all inspections and tests performed. These records shall include factual evidence that the required 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.

Daily and weekly summary test reports will be prepared and furnished to Sponsor and Contractor.

The forms to be used for these records are included in this section of the Construction Management Plan.

C. Final Test Reports

After completion of the project and before final payment is made, all test data from the Contractor's Quality Control Testing for each material used on the project shall be summarized in typed tabular form and submitted to the RPR in electronic format. No final payment will be made to the Contractor until this report has been received by the RPR.

Copies of typical test reports for each item of work are attached.

Quality Assurance tests only shall be used in the determination of pay factors for any material or for acceptance or rejection of any portion of the work.

FIELD DENSITY TESTS & COMPACTION CONTROL

JOB NAME: _____ DATE: _____ DAY: _____

JOB NUMBER: _____ SOIL CLASSIFICATION: _____

	Test No.								
	Date of Test								
	Location (use back if needed)								
	Lift								
	Elevation								
A	Wet Soil - gm								
B	Sand, start - gm								
C	Sand, end - gm								
D	Vol. Ring - gm								
E	Sand, end + ring - gm (C + D)								
F	Sand in Hole - gm (B - E)								
G	Density Sand - lb/cu ft								
H	Wet Density - lb/cu ft (A/F) * G								
	Est. Moisture - %								
	Tare No.								
I	Wet Wt. + Tare								
J	Dry Wt. + Tare								
K	Wt. Water (I - J)								
L	Wt. Tare								
M	Wt. Dry Soil (J - L)								
N	Water - % (K/M)								
O	Dry Density - lb/cu ft $[H/(1 + H)]$								
P	Max Dry Density - lb/cu ft								
	Optimum Moisture - %								
	Relative Compaction - % $[(O/P) \times 100]$								

Depth of Fill Remaining _____

REMARKS _____

Job Progress - % Completed _____

Inspector _____

Time _____ Mileage _____

L	2.0%	92.8%	90.5%
U	5.0%		

						Average			
						Std. Dev.			
						QL			
						QU			
						PL			
						PU			
						PWL			
						% Pay			
				Total	% Pay				

MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, CALIFORNIA

MULTIPURPOSE BUILDING - PHASE 2

AIP NO. 3-06-0146-0__-202X

SUMMARY OF COMPRESSIVE STRENGTH TEST RESULTS -
STRUCTURAL PORTLAND CEMENT CONCRETE

Sample ID	Location	Date Cast	Slump (inch)	Air Content	Compressive Strength - psi	
					7-day	28-day
	Specification		4 Max.	5% +/- 1.2%		4,000 Min.
	Specification - Floor Slab		4 Max.	2% +/- 0.5%		4,000 Min.

X. FINAL TEST AND QUALITY CONTROL REPORT

X. FINAL TEST AND QUALITY CONTROL REPORT

At the end of the project the RPR shall submit a final test and quality control report documenting the results of all tests performed both by the Contractor's Quality Control Program and the Sponsor's Quality Assurance Program. Those tests that failed or did not meet the applicable test standard shall be highlighted and corrective action/retesting noted. The report shall include the pay reductions applied or bonuses paid and justification for accepting any out-of-tolerance materials.

At the completion of the project the RPR will submit a Final Engineer's Report and Record Drawings. The summary test results of all Quality Control and Quality Assurance testing will be included in this report. Included in this final report will be the following:

- Brief Narrative of Work Accomplished
 - ✓ Include explanation for any deleted work items
 - ✓ Provide brief description of non-participating work items
- Project Photographs
 - ✓ Include a representative number of photographs that depict major elements of the project prior to the improvement and after completion of construction
- Summary of Key Milestone Dates
 - ✓ Receipt of Bids
 - ✓ Notice-To-Proceed
 - ✓ Substantial Completion
 - ✓ Contract
 - ✓ Final Inspection - Attach the final inspection record with any remaining punch list items as well
 - ✓ Final Acceptance
- Contract Time
 - ✓ Explanation of liquidated damages (if required)
 - ✓ Description of weather delays and winter shutdowns (Note: Calendar contracts require submittal of NWS data to support weather events exceeded the normal monthly events.)
- Labor Provisions
 - ✓ Statement of compliance with contract labor provisions (i.e. payroll reviews, etc.).
 - ✓ Summary of any complaints/findings and resolution.
- Environmental Requirements
 - ✓ Provide a statement if the environmental requirements were met and if not why.

- Summary of DBE Utilization
 - ✓ Prepare and submit a summary of the actual DBE participation compared to the contract goal.
- Contract Change Orders and Quantity Adjustments
 - ✓ Provide a change order summary with a delineation of eligible and ineligible costs
 - ✓ Detail and justify the changes required to engineering agreements, contract times, final construction quantities
 - ✓ Summarize FAA eligibility determinations from previously communicated change orders
- Construction Material Testing and Acceptance
 - ✓ Provide a summary of all required acceptance tests per the project specifications and the approved construction observation plan (Grant obligation).
 - ✓ Sponsor/consultant does not need to submit actual test reports with close out report but must make such information available upon request by the FAA.
 - ✓ The summary must provide clear explanation of any price adjustments due to the application of Percent Within Limit (PWL) rules.

**MAMMOTH YOSEMITE AIRPORT
MULTIPURPOSE BUILDING
PHASE 2**

FEDERAL PROJECT NO. AIP 3-06-0146-0XX-2026

Appendix E

GEOTECHNICAL REPORT



BRANDLEY
ENGINEERING

R. DAMON BRANDLEY, PE

MELISSA BRANDLEY, PE

May 24, 2026

Subject: Mammoth Yosemite Airport
Multipurpose Building Phase 2
Geotechnical Report

Dear Sir/Madam:

In response to your plan check for the subject project, we provide the following statements regarding the Geotechnical Report for this project:

1. The Geotechnical Report is based on the 2019 CBC. All recommendations outlined in the report remain valid under the currently adopted 2022 CBC.
2. All drawings (i.e. the foundation plan, the grading plan, and all pertinent details) have been reviewed and the Geotechnical Report recommendations are properly incorporated.

If you have any questions or further comments, please contact our office.

BRANDLEY ENGINEERING, INC.

Melissa S. Brandley, P.E.



5-24-2026

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, CALIFORNIA**

MULTIPURPOSE BUILDING WITH ARFF AND SRE COMPONENTS

GEOTECHNICAL REPORT

**October 27, 2022
(Revised January 27, 2023)
(Revised March 28, 2025)**



**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, CALIFORNIA**

MULTIPURPOSE BUILDING WITH ARFF AND SRE COMPONENTS

GEOTECHNICAL REPORT

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R. DAMON BRANDLEY, PE

BRANDLEY
ENGINEERING

MELISSA BRANDLEY, PE

October 27, 2022
Revised January 27, 2023
Revised March 28, 2025

**MAMMOTH YOSEMITE AIRPORT
MAMMOTH LAKES, CALIFORNIA**

MULTIPURPOSE BUILDING WITH ARFF AND SRE COMPONENTS

GEOTECHNICAL REPORT

I. Scope of Work

A geotechnical and foundation investigation has been conducted at the site of the proposed Multipurpose Building with ARFF and SRE Components at Mammoth Yosemite Airport in Mammoth Lakes, California. The purpose of this study is to summarize the geotechnical investigations performed, results observed and geotechnical recommendations for the foundation and floor slab design. This report presents the results of this investigation and corresponding recommendations.

II. Project Description

The Multipurpose Building project includes the construction of a new 7-bay Multipurpose Building with ARFF and SRE Components with Apron and Access Roads. This building will have a composite footprint of 10,740 sf with 10,191 sq. ft. on the first floor and 270 sq. ft. on the second floor, for a total of 10,461 sq. ft. of usable space. This facility will house the existing snow removal equipment, ARFF vehicle and ARFF support rooms at the airport.

The site work consists of a new access road (24' x 1,750'), automobile parking spaces on the landside, a new SRE/ARFF apron on the airside (90' x 188'), a new road between the ARFF Site and Taxiway A (24' x 190') and the Taxiway A3 connector taxiway between Taxiway A and the runway (35' x 225').

The Multipurpose Building project site is located east of the existing segmented circle and windcone and west of the existing east Corporate Hangars at Mammoth Yosemite Airport. The site location is currently undeveloped ground with a natural slope of approximately 3% to the north. The existing vegetation primarily consists of sagebrush scrub, low grasses and light vegetation with approximately 50% coverage. The site work will require approximately 3 to 5.5 feet of fill from existing grade to finished floor grade. The fill material will consist of local material generated onsite during site grading operations or from an existing stockpile of material generated from other projects on the airfield which consists of soil of a consistent nature to the soil from this

site. The Taxiway A3 is located between Taxiway A and the runway and consists of undeveloped ground with a slope of approximately 1 to 2% towards an existing drainage swale located approximately 50' south of Taxiway A.

III. Geotechnical Field and Laboratory Testing Program

Detailed soils investigations have been conducted on the site of the proposed Multipurpose Building at Mammoth Yosemite Airport. These investigations consisted of soil borings with Standard Penetration Tests and laboratory geotechnical testing and historical test pit data and geotechnical analysis.

The soil boring scope consisted of 3 test borings near the footprint of the building to a target depth of 25 feet and 6 additional test borings throughout the adjacent site work to a target depth of 10 feet. The soil borings were excavated using a truck mounted Dietrich 120 drill rig equipped with an automatic hammer. The test borings were drilled with an auger and undisturbed samples taken continuously for the full depth of the borings in accordance with the Standard Penetration Test (ASTM D1586) with a California Modified Split-Spoon Sampler. A drive blow record was recorded for each sample. The presence of any ground water was observed and noted. Soils were visually classified in the field by an engineer and further analyzed and visually classified in the laboratory by a Civil Engineer with a master's degree in Geotechnical Engineering.

Laboratory geotechnical testing consisted of performing density, moisture and gradation (ASTM C136) tests including hydrometer testing (ATMS D422). Representative samples of each boring from the undisturbed samples taken by the Modified Split-Spoon Sampler were tested for in place dry density and moisture content. Representative samples of each soil type encountered were tested for gradation (ASTM C136 & ASTM D422) to confirm and finalize the soil classification.

The historical test pit data and geotechnical analysis originated from an Engineers Report (including geotechnical data) from the Reconstruction of Runway 9-27 by Reinard W. Brandley Consulting Airport Engineer dated February 29, 2008. Test Pit T3 and T4 and associated data area located south of Runway 9-27 near the existing Taxiway A3 and were used for the new Taxiway A3 geotechnical evaluation. The 2008 gradation analysis test results from Test Pits T3 and T4 are shown in Table No. 3.

IV. Site Geology and Subsurface Conditions

The Multipurpose Building project at Mammoth Yosemite Airport is located within the Basin and Range Geomorphic Province of California, a province composed of subparallel, fault bounded ranges separated by down dropped basins know as horst and graben with interspersed lakes and playas.¹ The Geologic Map of the area indicates the site is underlain by Pleistocene-Holocene alluvium, lake playa and terrace deposits.²

The Mammoth Yosemite Airport is located east of Mammoth Mountain within the Long Valley Caldera which was formed 760,000 years ago by a cataclysmic eruption causing subsidence of a magma roof chamber. Over the next 120 years, additional eruptions deposited

¹Source: <https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf>

²Source: <https://maps.conservation.ca.gov/cgs/gmc/>

hot, crystal free rhyolite within the Caldera to form the resurgent dome. Later cooler, crystal rich rhyolite were slowly extruded.³

The soil borings indicate the underlying soils are fairly consistent over the site and with depth consisting of well graded coarse to fine silty sand with gravel and intermixed cobbles. Gradation results are shown in Table No. 1 and Table No. 2. The surface soils are loose due to weathering and disturbance. The soils below a depth of 1 to 2 feet are compact and stable. The 2008 Test Pit T3 and T4 gradation analysis indicates the soil in the vicinity of the relocated Taxiway A3 is consistent with the Multipurpose Building site. Gradation results from the 2008 geotechnical report are shown in Table No. 3. The Test Hole Location Map and Test Hole Boring Logs are shown on Plate No. 1 and Plate No. 2. Due to the cohesionless nature of the soil, expansive soil is not expected to be encountered at this site.

Ground water was not observed in any of the test holes to the depths indicated on the soil logs. It is reported that the ground water level in the vicinity of Mammoth Yosemite Airport is 35 to 40 feet deep in the general region.⁴ As a result, ground water is not expected to influence the foundations for this building.

Evaluation of frost susceptibility is an important consideration in order to protect the integrity of the foundations. Three conditions are required to create potential for frost heave including; cold climate, a frost susceptible soil type and a source of water close enough to supply capillary water to the frost line. The critical grain size for determination of frost susceptibility is 0.02mm. The gradation hydrometer test (ASTM D422) results indicate the local soil near the surface contains 8% of soil particles smaller than 0.02mm. In general, soils with less than 1% of soil particles smaller than 0.02mm will not be susceptible to frost heave. Soils with less than 3% soil particles smaller than 0.02mm have fairly low frost susceptibility. The soils type near the surface of the proposed Multipurpose Building project are considered to be frost susceptible. The depth of water table of 35 to 40 feet does not provide adequate source of water for capillary action. As a result, the level of frost susceptibility for this site is considered low.

V. Corrosion Evaluation

One soil sample was generated by combining several soil samples of the same material and tested for corrosion potential including minimum resistivity (CT 643), pH (ASTM D4972) and soluble sulfate and chlorides (CT 417 and CT 422). Test results are as follows:

Sample	Minimum Resistivity (ohm-cm)	pH	Sulfate (ppm)	Chloride (ppm)
MMH	3.48 X 1,000	5.53	2.0	17.5

Corrosive soils are defined as a soil that either has a chloride concentration of 500 ppm or greater, a sulfate concentration of 1,500 ppm or greater, or has a pH of 5.5 or less. The soil at Mammoth Yosemite Airport does not meet any of these criteria and thus is considered non-corrosive.

VI. Seismic Evaluation

³Source: <https://www.usgs.gov/volcanoes/long-valley-caldera/geologic-history-long-valley-mono-basin-region>

⁴ Source: Town of Mammoth Lakes PFAS Testing Report

The Multipurpose Building site at Mammoth Yosemite Airport is located in a seismically active area. As a result, evaluation of potential ground motion resulting from an earthquake is an important consideration in the geotechnical evaluation. The following summarizes the geotechnical seismic evaluation:

A. Seismic Design Parameters

The following site specific seismic design parameters are recommended based on the 2019 CBC and ASCE 7-16 standards with a Risk Category of II and site class designation of Site Class D. These parameters were obtained from <http://seismicmaps.org>.

$$S_S = 1.798$$

$$S_1 = 0.61$$

$$F_a = 1.2$$

$$S_{MS} = 2.158$$

$$S_{DS} = 1.439$$

$$F_v = 1.7$$

$$S_{M1} = 1.037$$

$$S_{D1} = 0.691$$

$$PGA = 0.732$$

$$PGA_m = 0.878$$

B. Seismic Hazard Analysis

1. Surface Fault Rupture

Evaluation of potential surface fault rupture is an important design consideration as a surface fault rupture would cause significant damage to the foundation and building. The Alquist-Priolo Earthquake Fault Zoning Act generated a database of active faults and their active fault zone boundaries. The closest fault zone to the Mammoth Yosemite Airport Multipurpose Building project is the Hilton Creek Fault Zone. This fault zone is located approximately 920 feet north of the Multipurpose Building. However, the defined fault zone is clear of the proposed building footprint as shown in Figure 1.

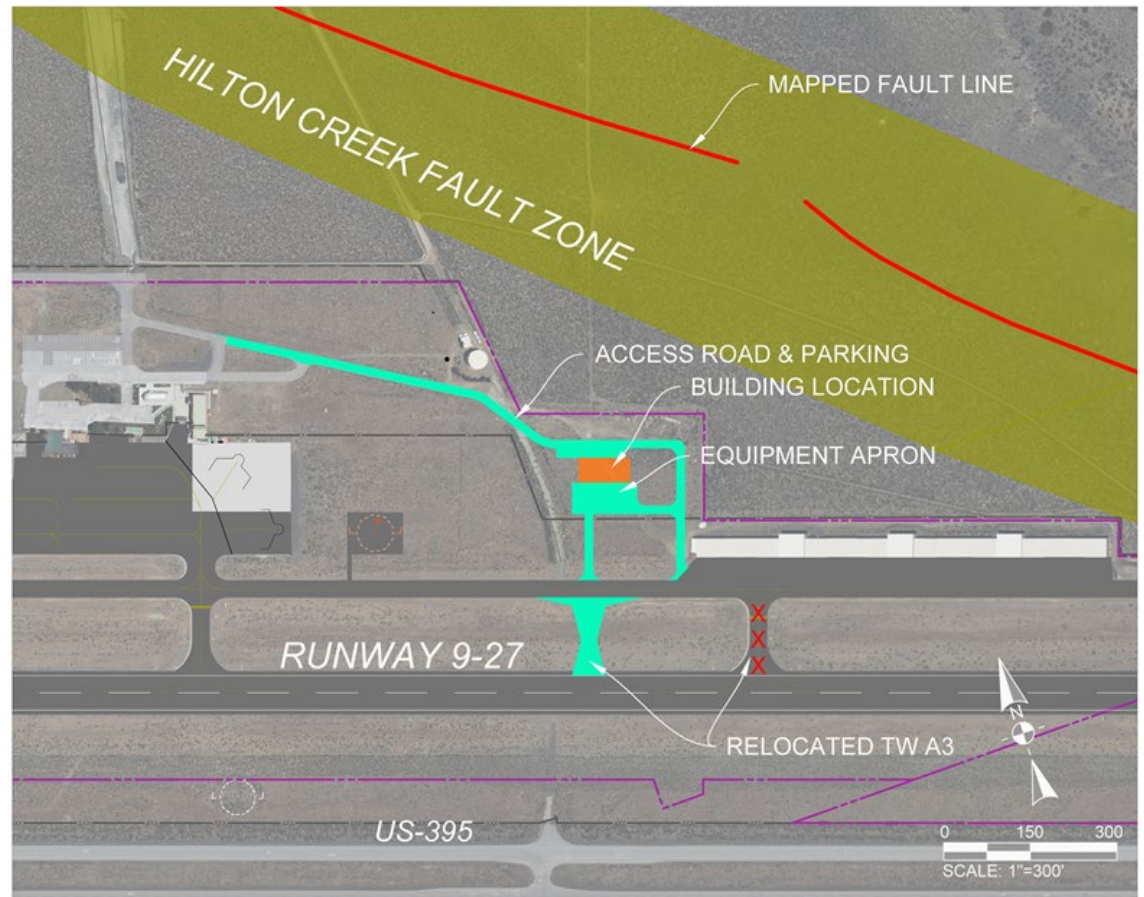


Figure 1 – Hilton Creek Fault Zone – Map showing proximity of site to Hilton Creek Fault Zone⁵

2. Liquefaction

Liquefaction is a phenomenon where susceptible soils develop rapid loss of shear strength when subjected to strong earthquake induced ground shaking due to a rise in pore water pressure and loss of grain-to-grain contact. Soil liquefaction potential is determined by the geology and soil composition. However, for liquefaction to occur, ground water must be present from either a shallow ground water table or perched ground water. The site geology consisting of Pleistocene-Holocene alluvium, lake playa and terrace deposits indicates moderate liquification risk. The composition of the soils being a well graded silty sand indicate moderate liquification risk. Based on the geology and soil classification there is a risk of soil liquefaction at this site. However, the depth of ground water table of 35 to 40 feet significantly decreases the liquefaction risk at this site to minimal.

The USGS produced a report in January 2018 titled *Scenario Earthquake Hazards for the Long Valley Caldera – Mono Lake Area, East-Central California* documenting the seismic liquefaction hazards for several earthquake scenarios. The Hilton Creek Fault M6.5 Scenario mapped areas in the vicinity of the Hilton

⁵ Source: <https://maps.conservation.ca.gov/cgs/EQZApp/app/> - California Department of Conservation

Creek fault that would be susceptible to liquefaction in a magnitude 6.5 Hilton Creek Fault earthquake scenario. The site of the Mammoth Yosemite Airport is within the Liquefaction Hazard Zone for locations with ground water less than 20 feet from the ground surface (see Figure 2). This analysis is consistent with our determination that the soil has moderate susceptibility for liquefaction. However, since the ground water table is significantly deeper than the defined 20 feet criteria to trigger liquefaction, the site liquefaction risk is considered minimal.

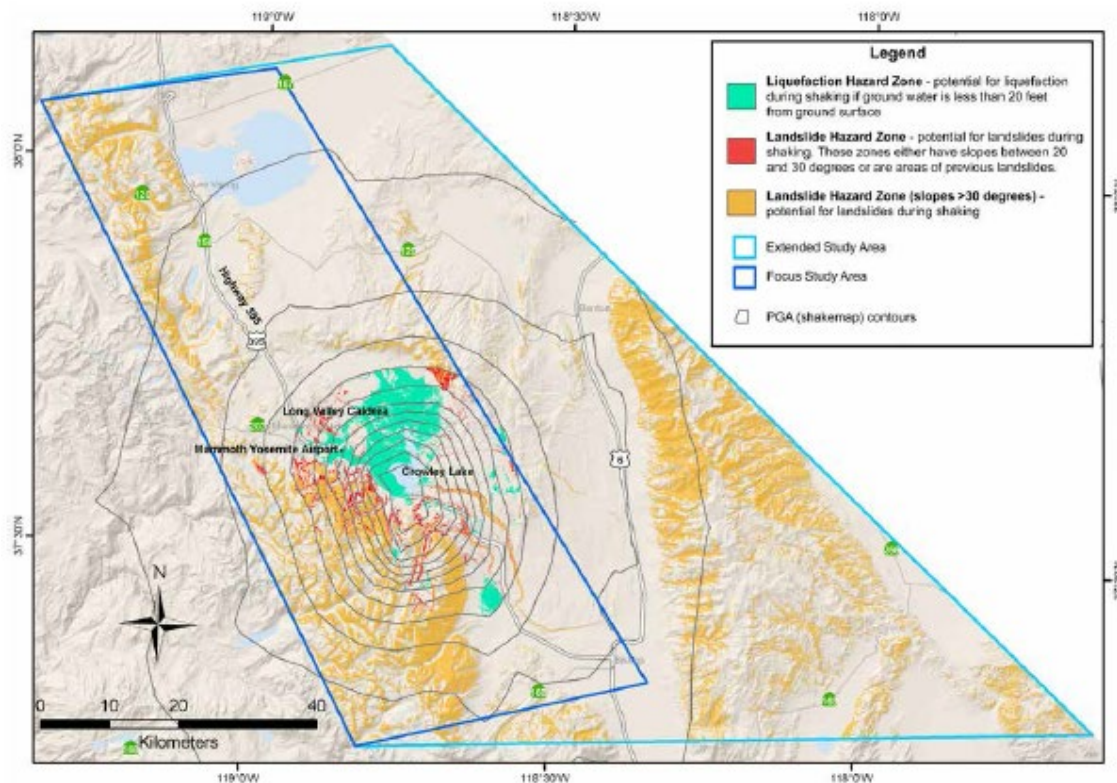


Figure 2 – Liquefaction Potential Map – Map showing potential liquefaction (green) and landslide (red and orange) areas for the Hilton Creek M6.5 scenario⁶

As a result of the site liquefaction risk being minimal, the risk of liquefaction induced lateral spreading is also minimal.

The landslide risk is minimal to none due to the gentle sloping of the existing site and minimal grading expected during construction.

3. Dynamic Seismic Settlement

The predominantly sandy soils have a tendency to densify when subject to earthquake shaking resulting in settlement at the ground surface. This settlement can damage the building shallow foundations and must be accommodated in the

⁶ Source: *Scenario Earthquake Hazards for the Long Valley Caldera – Mono Lake Area, East-Central California, January 2018, USGS*

design. The soils underlying the Multipurpose Building are predominantly well graded coarse to fine silty sands with gravel and cobbles and are very dry with quick drainage infiltration and a deep-water table. The dry sands densify very quickly, and settlement will typically be complete by the end of the earthquake. The dynamic seismic settlement of dry sand for the Multipurpose Building was calculated using the simplified procedure developed by Tokimatsu and Seed, 1987 using a 7.5 magnitude earthquake. Total dynamic seismic settlement is not expected to exceed 1 inch and differential settlement is not expected to exceed ½ inch.

VII. Geotechnical Recommendations

The field exploration, laboratory geotechnical testing and engineering analysis result in the following recommendations for the foundation of the Multipurpose Building at Mammoth Yosemite Airport:

A. Site Preparation

Prior to any work being performed on the foundations for the proposed building the site should be prepared in accordance with these recommendations. The site should be cleared of any existing vegetation and objectional material to a depth as required to adequately remove the existing root system. All materials generated by clearing and grubbing operations shall be disposed of off-site.

The site shall be graded as shown on the site work grading plan. All fill required shall be generated on site from the cut areas. The local soil contains cobbles throughout the site. The cobbles shall be removed during grading operations such that no cobbles greater than 4" shall be permitted in the top 6" of the subgrade. It is not anticipated to encounter unsuitable/unstable soil conditions on this site. If unsuitable/unstable soils are encountered, they shall be removed and replaced with suitable materials for a depth of 2 feet below the subgrade or bottom of footing. All subgrade materials shall be compacted as follows:

- Prior to all compaction activities, the soils shall be moisture conditioned to within 2% of optimum moisture content.
- Under all building areas and a minimum of 2' beyond the building limit, the top 12" of subgrade shall be scarified and recompact to 95% relative compaction per ASTM D1557.
- In fill areas, embankment shall be placed in lifts not less than 6" nor more than 12" of compacted thickness. Each lift shall be compacted to 95% relative compaction per ASTM D1557.
- Cobbles greater than 4" shall not be allowed in the top 6" of subgrade
- Finished subgrade shall be proof rolled to identify any weak areas with a fully loaded water truck with a minimum of 3 coverages.
- The bottom 6" of all foundation excavations shall be compacted to 95% relative compaction per ASTM D1557. Any cobbles present in the bottom or sides of the excavation shall be removed and replaced with suitable material.

The local soils are cohesionless soils that may be susceptible to collapse during foundation excavations. Care shall be taken to protect the sides of the excavations and any loose materials shall be removed. Methods of stabilization may be required to protect the sides of any excavations that exhibit collapse. Vehicle or equipment surcharge loading adjacent to the excavations shall be avoided to minimize soil collapse.

B. Frost Considerations

The soils and site conditions for the proposed Multipurpose Building have very low frost susceptibility. However, it is still recommended to mitigate against frost heave as an extra precaution. In order to prevent frost heave damage to the foundations, the bottom of the foundations shall extend a minimum of 12 inches below the designated frost penetration depth. Per the Town of Mammoth Lakes published Minimum Design Standards, the frost line is considered a minimum of 24 inches below grade. As a result, the recommended minimum depth of footings to prevent frost heave is 36 inches below finished grade level.

The dark colored asphalt pavements further decrease the potential for frost heave in pavement areas. As an extra precaution to prevent frost heave damage to the pavements, frost free pavement materials should be specified to a depth of 9 inches below finished grade level. A frost free pavement material can be achieved by limiting the percent passing the 0.02mm to a maximum of 2%.

C. Corrosion Considerations

The site is considered non-corrosive and no corrosion mitigation measures are recommended.

D. Foundation Recommendations

Based on the geotechnical analysis performed, the proposed Multipurpose Building at Mammoth Yosemite Airport, it is recommended to utilize shallow foundations with continuous strip footings or isolated footings. There are no known geologic hazards that would preclude the use of shallow foundations. The following recommendations are presented for the design of the shallow foundations.

- Minimum Footing Dimensions – The minimum footings dimensions shall be 36 inches square. The minimum depth of footing shall be 36 inches below finished grade to prevent frost heave.
- Allowable Bearing Pressure – The allowable bearing pressure shall be 2,000 pounds per square foot. The allowable bearing pressure may be increased by 1/3 for transient loads from wind or earthquake.
- Estimated Static Settlement – The total estimated static settlement will not exceed 1 inch and the differential settlement will not exceed ½ inch. The static settlement shall occur at initial application of loading.
- Estimated Dynamic Seismic Settlement – The total estimated dynamic seismic settlement of the dry sand will not exceed 1 inch and differential settlement will not exceed ½ inch in a 7.5 magnitude earthquake. The dynamic seismic settlement will occur immediately and will typically be complete by the conclusion of the earthquake.

- Allowable Coefficient of Friction – The allowable coefficient of friction to be used at the bottom of the footings is 0.25.
- Allowable Lateral Passive Resistance – The allowable passive resistance at the recommended minimum footing depth of 36 inches is 450 psf. This value may be increased by 150 psf for each additional foot of depth.

E. Pavement Subgrade Recommendations

The asphalt pavement sections and Portland cement concrete floor slab should be placed on subgrade prepared in accordance with the recommendations contained in this report. Previous geotechnical studies and reports support a subgrade CBR for the native subgrade of 8 to 15 when compacted to 90% relative compaction and 19 to 23 when compacted to 95% relative compaction. The gradation and soil classification of this site was compared to the previous geotechnical reports to confirm the soil is consistent with previous studies. The subgrade soil will be compacted to 95% relative compaction. However, experience has shown that with several cycles of freezing and thawing the density of these materials decrease over time and will typically stabilize around 90% relative compaction. The design of the pavement section is based on native soil compacted to 90% relative compaction with a subgrade CBR of 8.



Sieve Analysis of Coarse and Fine Aggregates

Project: G3 Laboratory Testing MPE No.: 05554-01
 Sample No.: ARFF Building Lab: 64066
 Tested By: NB Date: 7/20/2022

Sieve Analysis

(ASTM C136)

Values in grams

Total Sample Weight: 1833.0

Coarse Gradation		200 wash ran:		Fine Gradation		200 wash	
Weight sieved for Coarse gradation:		1833.0	<input type="checkbox"/> On entire sample <input checked="" type="checkbox"/> Fine Sieve portion only <input type="checkbox"/> No Wash Was run	Weight of split sample passing No.4		315.6	
Weight "passing" No. 4 including loss		864.0		Weight sieved for fine gradation		253.5	

Coarse Grading

Sieve Size	Individual Weight Retained	Cumulative Weight Retained	Cumulative Percent Retained	Cumulative Percent Passing	Specifications
5 inch				100%	-
4.5 inch				100%	-
4 inch				100%	-
3.5 inc				100%	-
3 inch				100%	-
1.5 inch	330.1	330.1	18.0%	82%	-
1 inch	136.1	466.2	25.4%	75%	-
3/4 inch	53.9	520.1	28.4%	72%	-
1/2 inch	100.9	621.0	33.9%	66%	-
3/8 inch	46.9	667.9	36.4%	64%	-
#4	133.8	801.7	43.7%	56%	-
#8	134.0	935.7	51.0%	49%	-
#10	33.3	969.0	52.9%	47%	-
Pan	864.0	1833.0	100.00%	0%	-

Fine Grading

Combined Grading

Sieve Size	Individual Weight Retained (fine Material)	Cumulative Weight Retained (Fine Material)	Cumulative Percent Retained (Fine Material)	Cumulative Percent Passing (Fine Material)	Cumulative Weight Retained (Total Sample)	Cumulative Percent Retained (Total Sample)	Cumulative Percent Passing (Total Sample)	Specification
#10	0						47%	-
#16	37	37.0	14.6%	85.4%	1070.3	58.4%	42%	-
							42%	-
#30	46.3	83.3	32.9%	67.1%	1197.0	65.3%	35%	-
							35%	-
#50	57.3	140.6	55.5%	44.5%	1353.9	73.9%	26%	-
#100	61.4	202.0	79.7%	20.3%	1522.0	83.0%	17%	-
#200	48.8	250.8	98.9%	1.1%	1655.6	90.3%	9.7%	-
Pan	2.6	253.4	100.0%	0.0%	1662.7	-	-	
200 wash	62.10	315.50		0.00%	1832.7	99.99%		

Limitations: Pursuant to applicable building codes, the results in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specifications were made and not communicated to Mid Pacific Engineering, Mid Pacific Engineering assumes no responsibility for pass/fail statements (meet/did not meet), if provided. This report may not be reproduced, except in full without written approval of Mid Pacific Engineering.

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GEOTECHNICAL ENGINEERING | EARTHWORK CONSTRUCTION TESTING | CONSTRUCTION MATERIALS ENGINEERING AND TESTING | CONSTRUCTION INSPECTION

Project: G3 Testing **MPE No.** 05554-01
Sample No. ARFF Building **Lab No.** 64066
Tested By: NB **Date:** 7/20/2022

Hydrometer Analysis

(ASTM D-422)

Pan Number:

Wet Weight of Hydro Sample:

Dry Weight of Hydro Sample:

Specific Gravity:

51.08 g

50.22 g

2.7 (assumed)

MOISTURE READING

PAN #

SN

PAN WT.

13.60 g

WET WT.

56.87 g

DRY WT.

56.14 g

MOISTURE %

1.7%

200 Wash

Pan #

239

Tare:

175.4

D+T:

213.3

Plus No. 10 Weight (washed & dried):

976.40 g

Total Wet Weight of Sample

1833.00 g

Dry Weight of Total Sample:

1802.08 g

Percent passing-No 10 :

45.8%

% Particles Passing the 200 sieve

11.2%

% Clay Particles (.0020) Passing

1.6%

DATE	TIME	ELAPSED TIME	TEMP.	HYDRO READING	COMPOSITE CORRECTION	CORRECTED	"152H" L (TABLE 2)	K Value (TABLE 3)	PASSING	D= K/√(L/T) TIME (IN MINUTES)
7/20/2022	9:05:00 AM	0	°F							
	9:06:00 AM	1	75.9	17.0	4.5	12.5	14.3	0.01282	11.40%	0.0485
	9:07:00 AM	2	75.9	14.0	4.5	9.5	14.8	0.01282	8.67%	0.0349
	9:10 AM	5	75.9	13.5	4.5	9	14.8	0.01282	8.21%	0.0221
	9:20 AM	15	75.7	11.0	4.5	6.5	15.3	0.01282	5.93%	0.0129
	9:35 AM	30	75.7	10.0	4.5	5.5	15.5	0.01282	5.02%	0.0092
	10:05 AM	60	75.9	8.0	4.5	3.5	15.8	0.01282	3.19%	0.0066
	11:05 AM	120	76.6	8.0	4.5	3.5	15.8	0.01267	3.19%	0.0046
	12:05 PM	180	77.5	7.5	4.5	3	15.8	0.01267	2.74%	0.0038
	1:15 AM	-470	78.3	7.5	4.5	3	15.8	0.01253	2.74%	
	2:05 PM	300	79.2	6.0	4	2	16	0.01253	1.82%	0.0029
7/21/2022	9:05 AM	1440	77	6.0	4.5	1.5	16.1	0.01267	1.37%	0.0013

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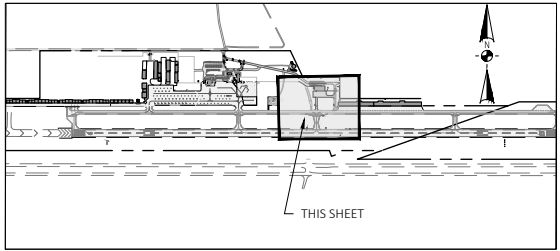
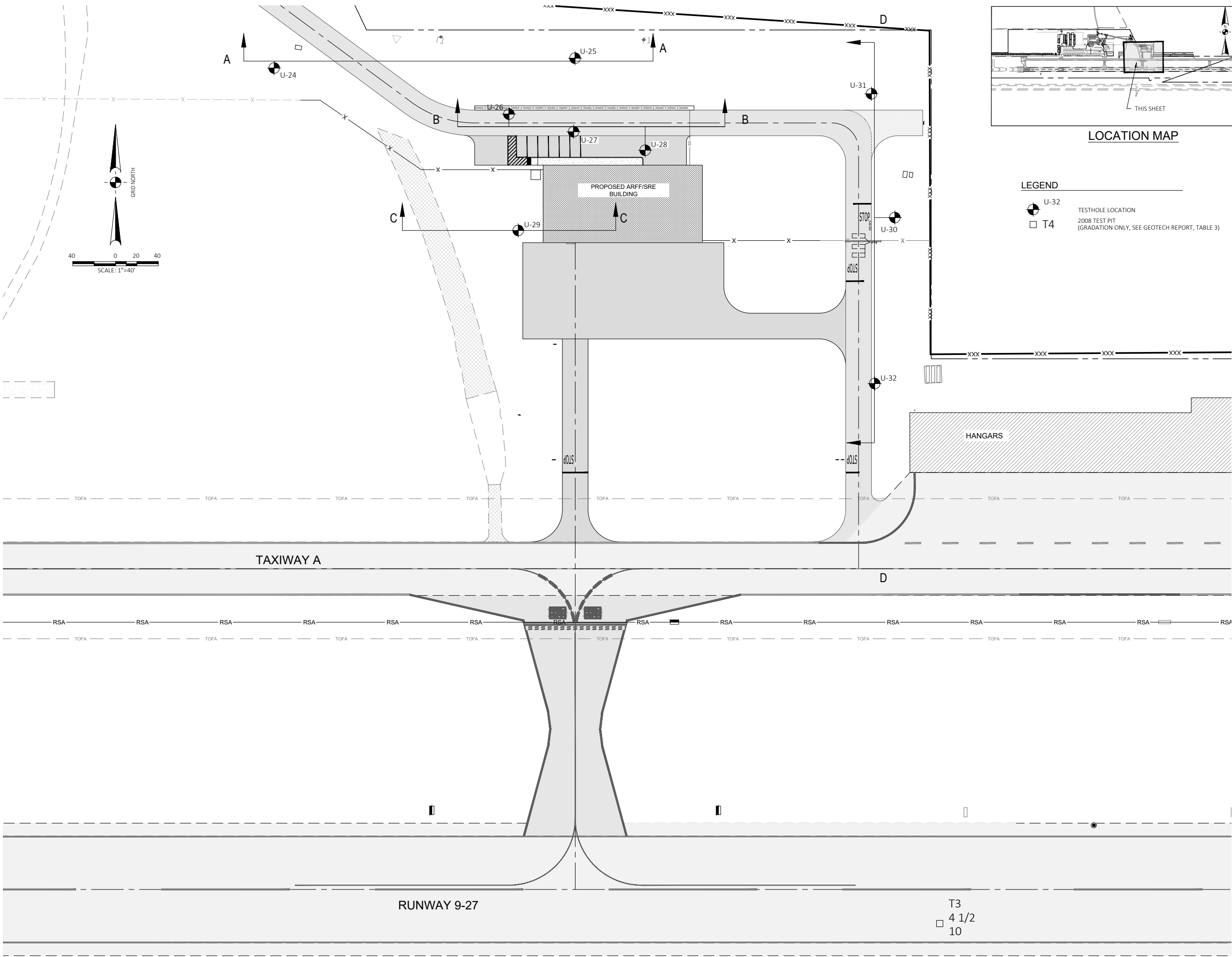
TABLE NO. 3

2008 GRADING ANALYSIS - PERCENT PASSING

Test Pit No. Material	T1 Subgrade	T2 Subgrade	T3 Subgrade	T4 Subgrade	T5 Subgrade	T6 Subgrade	T1 AB	T2 AB	T5 AB	T7 Crushed AC	T8 Crushed AC & AB	T9 Crushed AC & AB	T10 Crushed AC & AB
Sieve Size													
1-inch							100	100	100	100	100	100	100
3/4-inch							94	96	95	98	97	97	98
1/2-inch							80	85	82	78	83	82	80
3/8-inch	100	100	100	100	100	100	69	74	72	58	70	66	62
No. 4	82	88	83	85	91	90	53	58	58	33	52	41	39
No. 8	67	72	68	70	81	80	44	49	49	20	42	35	27
No. 16	51	56	52	54	70	68	37	41	42	12	34	27	19
No. 30	35	41	34	41	56	56	30	33	35	6.7	26	20	13
No. 50	17	27	21	28	39	40	21	24	27	4.0	19	15	9
No. 100	7.5	18	13	19	24	25	15	17	21	2.6	13	10	6.2
WASH 200	3.3	10	6.8	11	11	11	12	13	18	2.2	10	7.6	4.9
% Crushed Particles							99	91	93				

Notes:

1. Test Pits No. T1, T3 and T5 - Excavated in existing pavement section
2. Test Pits No. T2, T4, and T6 - Excavated in soil adjacent to runway.
3. Sample T7 represents sample of crushed AC.
4. Sample T8 represents 25% crushed AC and 75% existing base.
5. Sample T9 represents 50% crushed AC and 50% existing base.
6. Sample T10 represents 75% crushed AC and 25% existing base.



LOCATION MAP

- LEGEND
- U-32 TESTHOLE LOCATION
 - T4 2008 TEST PIT (GRADATION ONLY, SEE GEOTECH REPORT, TABLE 3)



ENGINEER OF RECORD		REVISIONS		BY		DATE	
No.							

MAMMOTH YOSEMITE AIRPORT		CALIFORNIA
MAMMOTH LAKES		
MULTIPURPOSE ARFF/SRE BUILDING		
TESTHOLE LOCATION PLAN		

DATE	3/28/2025
DRAWN	TS
CHECKED	MSB
PROJECT No.	75.21
FILE	7522.C0103.Sols
SCALE	1"=40'
SHEET No.	PLATE 1

